

SEQUENCE LISTING

<110> Merck & Co., Inc.

<120> POLYPEPTIDES FOR INDUCING A PROTECTIVE
IMMUNE RESPONSE AGAINST STAPHYLOCOCCUS AUREUS

<130> 21349Y PCT

<150> 60/489,840

<151> 2003-07-24

<160> 56

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 895

<212> PRT

<213> Staphylococcus aureus

<400> 1

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Met Asn Lys His His Pro Lys Leu Arg Ser Phe Tyr Ser Ile Arg Lys
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Ser Thr Leu Gly Val Ala Ser Val Ile Val Ser Thr Leu Phe Leu Ile
      20              25              30
Thr Ser Gln His Gln Ala Gln Ala Ala Glu Asn Thr Asn Thr Ser Asp
      35              40              45
Lys Ile Ser Glu Asn Gln Asn Asn Asn Ala Thr Thr Thr Gln Pro Pro
 50              55              60
Lys Asp Thr Asn Gln Thr Gln Pro Ala Thr Gln Pro Ala Asn Thr Ala
65              70              75              80
Lys Asn Tyr Pro Ala Ala Asp Glu Ser Leu Lys Asp Ala Ile Lys Asp
      85              90              95
Pro Ala Leu Glu Asn Lys Glu His Asp Ile Gly Pro Arg Glu Gln Val
      100              105              110
Asn Phe Gln Leu Leu Asp Lys Asn Asn Glu Thr Gln Tyr Tyr His Phe
      115              120              125
Phe Ser Ile Lys Asp Pro Ala Asp Val Tyr Tyr Thr Lys Lys Lys Ala
      130              135              140
Glu Val Glu Leu Asp Ile Asn Thr Ala Ser Thr Trp Lys Lys Phe Glu
145              150              155              160
Val Tyr Glu Asn Asn Gln Lys Leu Pro Val Arg Leu Val Ser Tyr Ser
      165              170              175
Pro Val Pro Glu Asp His Ala Tyr Ile Arg Phe Pro Val Ser Asp Gly
      180              185              190
Thr Gln Glu Leu Lys Ile Val Ser Ser Thr Gln Ile Asp Asp Gly Glu
      195              200              205
Glu Thr Asn Tyr Asp Tyr Thr Lys Leu Val Phe Ala Lys Pro Ile Tyr
      210              215              220
Asn Asp Pro Ser Leu Val Lys Ser Asp Thr Asn Asp Ala Val Val Thr
225              230              235              240
Asn Asp Gln Ser Ser Ser Val Ala Ser Asn Gln Thr Asn Thr Asn Thr
      245              250              255

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Ser Asn Gln Asn Thr Ser Thr Ile Asn Asn Ala Asn Asn Gln Pro Gln
      260      265      270
Ala Thr Thr Asn Met Ser Gln Pro Ala Gln Pro Lys Ser Ser Thr Asn
      275      280      285
Ala Asp Gln Ala Ser Ser Gln Pro Ala His Glu Thr Asn Ser Asn Gly
      290      295      300
Asn Thr Asn Asp Lys Thr Asn Glu Ser Ser Asn Gln Ser Asp Val Asn
305      310      315      320
Gln Gln Tyr Pro Pro Ala Asp Glu Ser Leu Gln Asp Ala Ile Lys Asn
      325      330      335
Pro Ala Ile Ile Asp Lys Glu His Thr Ala Asp Asn Trp Arg Pro Ile
      340      345      350
Asp Phe Gln Met Lys Asn Asp Lys Gly Glu Arg Gln Phe Tyr His Tyr
      355      360      365
Ala Ser Thr Val Glu Pro Ala Thr Val Ile Phe Thr Lys Thr Gly Pro
      370      375      380
Ile Ile Glu Leu Gly Leu Lys Thr Ala Ser Thr Trp Lys Lys Phe Glu
385      390      395      400
Val Tyr Glu Gly Asp Lys Lys Leu Pro Val Glu Leu Val Ser Tyr Asp
      405      410      415
Ser Asp Lys Asp Tyr Ala Tyr Ile Arg Phe Pro Val Ser Asn Gly Thr
      420      425      430
Arg Glu Val Lys Ile Val Ser Ser Ile Glu Tyr Gly Glu Asn Ile His
      435      440      445
Glu Asp Tyr Asp Tyr Thr Leu Met Val Phe Ala Gln Pro Ile Thr Asn
450      455      460
Asn Pro Asp Asp Tyr Val Asp Glu Glu Thr Tyr Asn Leu Gln Lys Leu
465      470      475      480
Leu Ala Pro Tyr His Lys Ala Lys Thr Leu Glu Arg Gln Val Tyr Glu
      485      490      495
Leu Glu Lys Leu Gln Glu Lys Leu Pro Glu Lys Tyr Lys Ala Glu Tyr
      500      505      510
Lys Lys Lys Leu Asp Gln Thr Arg Val Glu Leu Ala Asp Gln Val Lys
      515      520      525
Ser Ala Val Thr Glu Phe Glu Asn Val Thr Pro Thr Asn Asp Gln Leu
530      535      540
Thr Asp Leu Gln Glu Ala His Phe Val Val Phe Glu Ser Glu Glu Asn
545      550      555      560
Ser Glu Ser Val Met Asp Gly Phe Val Glu His Pro Phe Tyr Thr Ala
      565      570      575
Thr Leu Asn Gly Gln Lys Tyr Val Val Met Lys Thr Lys Asp Asp Ser
      580      585      590
Tyr Trp Lys Asp Leu Ile Val Glu Gly Lys Arg Val Thr Thr Val Ser
      595      600      605
Lys Asp Pro Lys Asn Asn Ser Arg Thr Leu Ile Phe Pro Tyr Ile Pro
610      615      620
Asp Lys Ala Val Tyr Asn Ala Ile Val Lys Val Val Ala Asn Ile
625      630      635      640
Gly Tyr Glu Gly Gln Tyr His Val Arg Ile Ile Asn Gln Asp Ile Asn
      645      650      655
Thr Lys Asp Asp Asp Thr Ser Gln Asn Asn Thr Ser Glu Pro Leu Asn
      660      665      670
Val Gln Thr Gly Gln Glu Gly Lys Val Ala Asp Thr Asp Val Ala Glu
      675      680      685

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Asn Ser Ser Thr Ala Thr Asn Pro Lys Asp Ala Ser Asp Lys Ala Asp
 690          695          700
Val Ile Glu Pro Glu Ser Asp Val Val Lys Asp Ala Asp Asn Asn Ile
705          710          715          720
Asp Lys Asp Val Gln His Asp Val Asp His Leu Ser Asp Met Ser Asp
          725          730          735
Asn Asn His Phe Asp Lys Tyr Asp Leu Lys Glu Met Asp Thr Gln Ile
          740          745          750
Ala Lys Asp Thr Asp Arg Asn Val Asp Lys Asp Ala Asp Asn Ser Val
          755          760          765
Gly Met Ser Ser Asn Val Asp Thr Asp Lys Asp Ser Asn Lys Asn Lys
          770          775          780
Asp Lys Val Ile Gln Leu Asn His Ile Ala Asp Lys Asn Asn His Thr
785          790          795          800
Gly Lys Ala Ala Lys Leu Asp Val Val Lys Gln Asn Tyr Asn Asn Thr
          805          810          815
Asp Lys Val Thr Asp Lys Lys Thr Thr Glu His Leu Pro Ser Asp Ile
          820          825          830
His Lys Thr Val Asp Lys Thr Val Lys Thr Lys Glu Lys Ala Gly Thr
          835          840          845
Pro Ser Lys Glu Asn Lys Leu Ser Gln Ser Lys Met Leu Pro Lys Thr
          850          855          860
Gly Glu Thr Thr Ser Ser Gln Ser Trp Trp Gly Leu Tyr Ala Leu Leu
865          870          875          880
Gly Met Leu Ala Leu Phe Ile Pro Lys Phe Arg Lys Glu Ser Lys
          885          890          895

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<210> 2

<211> 645

<212> PRT

<213> Staphylococcus aureus

<400> 2

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Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
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Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu
          20          25          30
Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
          35          40          45
Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
          50          55          60
Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
65          70          75          80
Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
          85          90          95
Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
          100          105          110
Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
          115          120          125
Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His Ser
          130          135          140
Ala Pro Asn Ser Arg Pro Ile Asp Phe Glu Met Lys Lys Lys Asp Gly
145          150          155          160
Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Lys Pro Ala Arg Val
          165          170          175

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Ile	Phe	Thr	Asp	Ser	Lys	Pro	Glu	Ile	Glu	Leu	Gly	Leu	Gln	Ser	Gly	180	185	190
Gln	Phe	Trp	Arg	Lys	Phe	Glu	Val	Tyr	Glu	Gly	Asp	Lys	Lys	Leu	Pro	195	200	205
Ile	Lys	Leu	Val	Ser	Tyr	Asp	Thr	Val	Lys	Asp	Tyr	Ala	Tyr	Ile	Arg	210	215	220
Phe	Ser	Val	Ser	Asn	Gly	Thr	Lys	Ala	Val	Lys	Ile	Val	Ser	Ser	Thr	225	230	235
His	Phe	Asn	Asn	Lys	Glu	Glu	Lys	Tyr	Asp	Tyr	Thr	Leu	Met	Glu	Phe	245	250	255
Ala	Gln	Pro	Ile	Tyr	Asn	Ser	Ala	Asp	Lys	Phe	Lys	Thr	Glu	Glu	Asp	260	265	270
Tyr	Lys	Ala	Glu	Lys	Leu	Leu	Ala	Pro	Tyr	Lys	Lys	Ala	Lys	Thr	Leu	275	280	285
Glu	Arg	Gln	Val	Tyr	Glu	Leu	Asn	Lys	Ile	Gln	Asp	Lys	Leu	Pro	Glu	290	295	300
Lys	Leu	Lys	Ala	Glu	Tyr	Lys	Lys	Lys	Leu	Glu	Asp	Thr	Lys	Lys	Ala	305	310	315
Leu	Asp	Glu	Gln	Val	Lys	Ser	Ala	Ile	Thr	Glu	Phe	Gln	Asn	Val	Gln	325	330	335
Pro	Thr	Asn	Glu	Lys	Met	Thr	Asp	Leu	Gln	Asp	Thr	Lys	Tyr	Val	Val	340	345	350
Tyr	Glu	Ser	Val	Glu	Asn	Asn	Glu	Ser	Met	Met	Asp	Thr	Phe	Val	Lys	355	360	365
His	Pro	Ile	Lys	Thr	Gly	Met	Leu	Asn	Gly	Lys	Lys	Tyr	Met	Val	Met	370	375	380
Glu	Thr	Thr	Asn	Asp	Asp	Tyr	Trp	Lys	Asp	Phe	Met	Val	Glu	Gly	Gln	385	390	395
Arg	Val	Arg	Thr	Ile	Ser	Lys	Asp	Ala	Lys	Asn	Asn	Thr	Arg	Thr	Ile	405	410	415
Ile	Phe	Pro	Tyr	Val	Glu	Gly	Lys	Thr	Leu	Tyr	Asp	Ala	Ile	Val	Lys	420	425	430
Val	His	Val	Lys	Thr	Ile	Asp	Tyr	Asp	Gly	Gln	Tyr	His	Val	Arg	Ile	435	440	445
Val	Asp	Lys	Glu	Ala	Phe	Thr	Lys	Ala	Asn	Thr	Asp	Lys	Ser	Asn	Lys	450	455	460
Lys	Glu	Gln	Gln	Asp	Asn	Ser	Ala	Lys	Lys	Glu	Ala	Thr	Pro	Ala	Thr	465	470	475
Pro	Ser	Lys	Pro	Thr	Pro	Ser	Pro	Val	Glu	Lys	Glu	Ser	Gln	Lys	Gln	485	490	495
Asp	Ser	Gln	Lys	Asp	Asp	Asn	Lys	Gln	Leu	Pro	Ser	Val	Glu	Lys	Glu	500	505	510
Asn	Asp	Ala	Ser	Ser	Glu	Ser	Gly	Lys	Asp	Lys	Thr	Pro	Ala	Thr	Lys	515	520	525
Pro	Thr	Lys	Gly	Glu	Val	Glu	Ser	Ser	Ser	Thr	Thr	Pro	Thr	Lys	Val	530	535	540
Val	Ser	Thr	Thr	Gln	Asn	Val	Ala	Lys	Pro	Thr	Thr	Ala	Ser	Ser	Lys	545	550	555
Thr	Thr	Lys	Asp	Val	Val	Gln	Thr	Ser	Ala	Gly	Ser	Ser	Glu	Ala	Lys	565	570	575
Asp	Ser	Ala	Pro	Leu	Gln	Lys	Ala	Asn	Ile	Lys	Asn	Thr	Asn	Asp	Gly	580	585	590
His	Thr	Gln	Ser	Gln	Asn	Asn	Lys	Asn	Thr	Gln	Glu	Asn	Lys	Ala	Lys	595	600	605

Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
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 Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
 625 630 635 640
 Arg Lys Arg Lys Asn
 645

<210> 3
 <211> 649
 <212> PRT
 <213> Staphylococcus aureus

<400> 3
 Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
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 Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu Leu
 20 25 30
 Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
 35 40 45
 Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50 55 60
 Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65 70 75 80
 Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
 85 90 95
 Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
 100 105 110
 Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
 115 120 125
 Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His Ser
 130 135 140
 Ala Pro Asn Ser Arg Pro Ile Asp Phe Glu Met Lys Lys Lys Asp Gly
 145 150 155 160
 Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Lys Pro Ala Arg Val
 165 170 175
 Ile Phe Thr Asp Ser Lys Pro Glu Ile Glu Leu Gly Leu Gln Ser Gly
 180 185 190
 Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
 195 200 205
 Ile Lys Leu Val Ser Tyr Asp Thr Val Lys Asp Tyr Ala Tyr Ile Arg
 210 215 220
 Phe Ser Val Ser Asn Gly Thr Lys Ala Val Lys Ile Val Ser Ser Thr
 225 230 235 240
 His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Glu Phe
 245 250 255
 Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
 260 265 270
 Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275 280 285
 Glu Arg Gln Val Tyr Glu Leu Asn Lys Ile Gln Asp Lys Leu Pro Glu
 290 295 300
 Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Asp Thr Lys Lys Ala
 305 310 315 320
 Leu Asp Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
 325 330 335

Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val
 340 345 350
 Tyr Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys
 355 360 365
 His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met
 370 375 380
 Glu Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln
 385 390 395 400
 Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
 405 410 415
 Ile Phe Pro Tyr Val Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys
 420 425 430
 Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460
 Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495
 Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
 500 505 510
 Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
 515 520 525
 Pro Thr Lys Gly Lys Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
 530 535 540
 Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
 545 550 555 560
 Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
 565 570 575
 Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
 580 585 590
 His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
 595 600 605
 Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
 610 615 620
 Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
 625 630 635 640
 Arg Lys Arg Lys Asn Leu Glu Lys Thr
 645

<210> 4

<211> 647

<212> PRT

<213> Staphylococcus aureus

<400> 4

Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
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 20 25 30
 Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
 35 40 45
 Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50 55 60

Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65 70 75 80
 Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
 85 90 95
 Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Ala Val Lys
 100 105 110
 Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
 115 120 125
 Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His Ser
 130 135 140
 Ala Pro Asn Ser Arg Pro Ile Asp Phe Glu Met Lys Lys Glu Asn Gly
 145 150 155 160
 Glu Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Lys Pro Ala Arg Val
 165 170 175
 Ile Phe Thr Asp Ser Lys Pro Glu Ile Glu Leu Gly Leu Gln Ser Gly
 180 185 190
 Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
 195 200 205
 Ile Lys Leu Val Ser Tyr Asp Thr Val Lys Asp Tyr Ala Tyr Ile Arg
 210 215 220
 Phe Ser Val Ser Asn Gly Thr Lys Ala Val Lys Ile Val Ser Ser Thr
 225 230 235 240
 His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Glu Phe
 245 250 255
 Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
 260 265 270
 Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275 280 285
 Glu Arg Gln Val Tyr Glu Leu Asn Lys Ile Gln Asp Lys Leu Pro Glu
 290 295 300
 Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Asp Thr Lys Lys Ala
 305 310 315 320
 Leu Asp Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
 325 330 335
 Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val
 340 345 350
 Tyr Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys
 355 360 365
 His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met
 370 375 380
 Glu Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln
 385 390 395 400
 Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
 405 410 415
 Ile Phe Pro Tyr Val Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys
 420 425 430
 Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460
 Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495

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Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
      500      505      510
Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
      515      520      525
Pro Thr Lys Gly Glu Val Glu Ser Ser Thr Thr Pro Thr Lys Val Val
      530      535      540
Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Ala Ser Ser Lys Thr Thr
545      550      555      560
Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys Asp Ser
      565      570      575
Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly His Thr
      580      585      590
Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys Ser Leu
      595      600      605
Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro Leu Met
      610      615      620
Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro Arg Lys
625      630      635      640
Arg Lys Asn Leu Glu Lys Pro
      645

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<210> 5

<211> 645

<212> PRT

<213> Staphylococcus aureus

<400> 5

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Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
1      5      10      15
Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu Leu
      20      25      30
Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr Asn
      35      40      45
Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr Thr
      50      55      60
Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser Val
      65      70      75      80
Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala Lys
      85      90      95
Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Ala Val Lys Pro
      100      105      110
Ala Thr Lys Ala Asp Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu Leu
      115      120      125
Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His Ser Ala
      130      135      140
Pro Asn Ser Arg Pro Ile Asp Phe Glu Met Lys Lys Glu Asn Gly Glu
      145      150      155      160
Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Lys Pro Ala Arg Val Ile
      165      170      175
Phe Thr Asp Ser Lys Pro Glu Ile Glu Leu Gly Leu Gln Ser Gly Gln
      180      185      190
Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro Ile
      195      200      205
Lys Leu Val Ser Tyr Asp Thr Val Lys Asp Tyr Ala Tyr Ile Arg Phe
      210      215      220

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Ser Val Ser Asn Gly Thr Lys Ala Val Lys Ile Val Ser Ser Thr His
 225 230 235 240
 Phe Asn Asn Lys Glu Lys Tyr Asp Tyr Thr Leu Met Glu Phe Ala
 245 250 255
 Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp Tyr
 260 265 270
 Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu Glu
 275 280 285
 Arg Gln Val Tyr Glu Leu Asn Lys Ile Gln Asp Lys Leu Pro Glu Lys
 290 295 300
 Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Asp Thr Lys Lys Ala Leu
 305 310 315 320
 Asp Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln Pro
 325 330 335
 Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val Tyr
 340 345 350
 Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys His
 355 360 365
 Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met Glu
 370 375 380
 Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln Arg
 385 390 395 400
 Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile Ile
 405 410 415
 Phe Pro Tyr Val Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys Val
 420 425 430
 His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile Val
 435 440 445
 Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys Lys
 450 455 460
 Glu Gln Gln Asp Asn Ser Ala Lys Arg Glu Ala Thr Pro Ala Thr Pro
 465 470 475 480
 Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln Asp
 485 490 495
 Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu Asn
 500 505 510
 Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys Pro
 515 520 525
 Ala Lys Gly Glu Val Glu Ser Ser Thr Thr Pro Thr Lys Val Val
 530 535 540
 Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys Thr
 545 550 555 560
 Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys Asp
 565 570 575
 Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly His
 580 585 590
 Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys Ser
 595 600 605
 Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro Leu
 610 615 620
 Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro Arg
 625 630 635 640
 Lys Arg Lys Asn Leu
 645

<210> 6

<211> 645

<212> PRT

<213> Staphylococcus aureus

<400> 6

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Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1          5          10          15
Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu
 20          25          30
Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr Asn
 35          40          45
Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr Thr
 50          55          60
Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser Val
 65          70          75          80
Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala Lys
 85          90          95
Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Ala Val Lys Pro
100          105          110
Ala Thr Lys Ala Asp Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu Leu
115          120          125
Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His Ser Ala
130          135          140
Pro Asn Ser Arg Pro Ile Asp Phe Glu Met Lys Lys Glu Asn Gly Glu
145          150          155          160
Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Lys Pro Ala Arg Val Ile
165          170          175
Phe Thr Asp Ser Lys Pro Glu Ile Glu Leu Gly Leu Gln Ser Gly Gln
180          185          190
Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro Ile
195          200          205
Lys Leu Val Ser Tyr Asp Thr Val Lys Asp Tyr Ala Tyr Ile Arg Phe
210          215          220
Ser Val Ser Asn Gly Thr Lys Ala Val Lys Ile Val Ser Ser Thr His
225          230          235          240
Phe Asn Asn Lys Glu Lys Tyr Asp Tyr Thr Leu Met Glu Phe Ala
245          250          255
Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp Tyr
260          265          270
Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu Glu
275          280          285
Arg Gln Val Tyr Glu Leu Asn Lys Ile Gln Asp Lys Leu Pro Glu Lys
290          295          300
Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Asp Thr Lys Lys Ala Leu
305          310          315          320
Asp Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln Pro
325          330          335
Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val Tyr
340          345          350
Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys His
355          360          365
Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met Glu
370          375          380

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Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln Arg
385          390          395          400
Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile Ile
          405          410          415
Phe Pro Tyr Val Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys Val
          420          425          430
His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile Val
          435          440          445
Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys Lys
          450          455          460
Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr Pro
465          470          475          480
Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln Asp
          485          490          495
Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu Asn
          500          505          510
Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys Pro
          515          520          525
Ala Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val Val
          530          535          540
Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys Thr
545          550          555          560
Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys Asp
          565          570          575
Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly His
          580          585          590
Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys Ser
          595          600          605
Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro Leu
          610          615          620
Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro Arg
625          630          635          640
Lys Arg Lys Asn Leu
          645

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<210> 7

<211> 654

<212> PRT

<213> Staphylococcus aureus

<400> 7

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Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
1          5          10          15
Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu Leu
          20          25          30
Met Ser Asn Gly Glu Ala Lys Ala Ala Glu Glu Thr Gly Gly Thr Ile
          35          40          45
Thr Glu Thr Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr Thr
          50          55          60
Thr Glu Lys Ala Pro Glu Ala Lys Pro Val Ala Asn Ala Val Ser Val
65          70          75          80
Ser Asn Lys Glu Val Val Ala Pro Thr Thr Glu Thr Lys Glu Ala Lys
          85          90          95
Glu Val Lys Glu Val Lys Ala Pro Asn Glu Thr Lys Glu Val Lys Pro
          100          105          110

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Ala Ala Lys Ser Asp Asn Asn Thr Tyr Pro Ile Leu Asn Glu Glu Leu
 115 120 125
 Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His Ser Ala
 130 135 140
 Pro Asn Ser Arg Pro Ile Asp Phe Glu Met Lys Lys Lys Asp Gly Thr
 145 150 155 160
 Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Lys Pro Ala Arg Val Ile
 165 170 175
 Phe Thr Asp Ser Lys Pro Glu Ile Glu Leu Gly Leu Gln Ser Gly Gln
 180 185 190
 Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro Ile
 195 200 205
 Lys Leu Val Ser Tyr Asp Thr Val Lys Asp Tyr Ala Tyr Ile Arg Phe
 210 215 220
 Ser Val Ser Asn Gly Thr Lys Ala Val Lys Ile Val Ser Ser Thr His
 225 230 235 240
 Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Glu Phe Ala
 245 250 255
 Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp Tyr
 260 265 270
 Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu Glu
 275 280 285
 Arg Gln Val Tyr Glu Leu Asn Lys Ile Gln Asp Lys Leu Pro Glu Lys
 290 295 300
 Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Glu Thr Lys Lys Ala Leu
 305 310 315 320
 Asp Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln Pro
 325 330 335
 Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val Tyr
 340 345 350
 Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys His
 355 360 365
 Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met Glu
 370 375 380
 Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Glu Arg
 385 390 395 400
 Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile Ile
 405 410 415
 Phe Pro Tyr Val Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys Val
 420 425 430
 His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile Val
 435 440 445
 Asp Lys Glu Ala Phe Thr Lys Ala Asn Ala Asp Lys Ser Asn Lys Lys
 450 455 460
 Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr Pro
 465 470 475 480
 Ser Lys Pro Thr Thr Ala Pro Val Glu Lys Glu Ser Gln Lys Gln Asp
 485 490 495
 Ser Gln Lys Asp Asp Asn Lys Gln Ser Pro Ser Val Glu Lys Glu Ile
 500 505 510
 Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys Pro
 515 520 525
 Ala Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val Val
 530 535 540

Ser Ala Thr Gln Asn Val Ala Lys Pro Thr Ser Ala Ser Ser Glu Thr
 545 550 555 560
 Thr Lys Gly Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys Asp
 565 570 575
 Asn Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly His
 580 585 590
 Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys Ser
 595 600 605
 Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro Leu
 610 615 620
 Met Ala Leu Leu Ala Leu Ser Ser Ile Ile Ala Phe Val Leu Pro Arg
 625 630 635 640
 Lys Arg Lys Asn Leu Glu Lys Pro Val Arg Ala Asn Ser Ser
 645 650

<210> 8

<211> 645

<212> PRT

<213> Artificial Sequence

<220>

<223> Hybrid sequence

<400> 8

Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1 5 10 15
 Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu
 20 25 30
 Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
 35 40 45
 Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50 55 60
 Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65 70 75 80
 Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
 85 90 95
 Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
 100 105 110
 Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
 115 120 125
 Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Ile Asp Lys Asp His Ser
 130 135 140
 Ala Pro Asn Trp Arg Pro Ile Asp Phe Glu Met Lys Asn Asp Lys Gly
 145 150 155 160
 Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Glu Pro Ala Arg Val
 165 170 175
 Ile Phe Thr Lys Ser Lys Pro Ile Ile Glu Leu Gly Leu Gln Ser Gly
 180 185 190
 Ser Thr Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
 195 200 205
 Ile Lys Leu Val Ser Tyr Asp Thr Asp Lys Asp Tyr Ala Tyr Ile Arg
 210 215 220
 Phe Ser Val Ser Asn Gly Thr Lys Glu Val Lys Ile Val Ser Ser Thr
 225 230 235 240

His Phe Gly Glu Asn Ile His Lys Tyr Asp Tyr Thr Leu Met Val Phe
 245 250 255
 Ala Gln Pro Ile Tyr Asn Asn Pro Asp Lys Phe Val Asp Glu Glu Asp
 260 265 270
 Tyr Asn Leu Gln Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275 280 285
 Glu Arg Gln Val Tyr Glu Leu Glu Lys Ile Gln Asp Lys Leu Pro Glu
 290 295 300
 Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Gln Thr Lys Lys Ala
 305 310 315 320
 Leu Ala Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
 325 330 335
 Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Ala His Tyr Val Val
 340 345 350
 Tyr Glu Ser Val Glu Asn Ser Glu Ser Met Met Asp Thr Phe Val Glu
 355 360 365
 His Pro Ile Lys Thr Gly Thr Leu Asn Gly Lys Lys Tyr Met Val Met
 370 375 380
 Lys Thr Thr Asn Asp Ser Tyr Trp Lys Asp Phe Met Val Glu Gly Lys
 385 390 395 400
 Arg Val Arg Thr Ile Ser Lys Asp Pro Lys Asn Asn Thr Arg Thr Ile
 405 410 415
 Ile Phe Pro Tyr Val Glu Gly Lys Ala Leu Tyr Asp Ala Ile Val Lys
 420 425 430
 Val Val Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ile Asn Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460
 Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495
 Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
 500 505 510
 Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
 515 520 525
 Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
 530 535 540
 Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
 545 550 555 560
 Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
 565 570 575
 Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
 580 585 590
 His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
 595 600 605
 Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
 610 615 620
 Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
 625 630 635 640
 Arg Lys Arg Lys Asn
 645

<210> 9

<211> 645

<212> PRT

<213> Artificial Sequence

<220>

<223> Hybrid sequence

<400> 9

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Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1           5           10           15
Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu
 20           25           30
Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
 35           40           45
Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50           55           60
Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65           70           75           80
Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
 85           90           95
Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
 100          105          110
Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
 115          120          125
Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Glu His Ser
 130          135          140
Ala Pro Asn Ser Arg Pro Ile Asp Phe Glu Met Lys Lys Lys Asp Gly
 145          150          155          160
Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Lys Pro Ala Arg Val
 165          170          175
Ile Phe Thr Asp Ser Lys Pro Glu Ile Glu Leu Gly Leu Gln Ser Gly
 180          185          190
Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
 195          200          205
Val Lys Leu Val Ser Tyr Asp Thr Val Lys Asp Tyr Ala Tyr Ile Arg
 210          215          220
Phe Ser Val Ser Asn Gly Thr Lys Ala Val Lys Ile Val Ser Ser Thr
 225          230          235          240
His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Glu Phe
 245          250          255
Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
 260          265          270
Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275          280          285
Glu Arg Gln Val Tyr Glu Leu Asn Lys Leu Gln Glu Lys Leu Pro Glu
 290          295          300
Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Asp Thr Lys Lys Ala
 305          310          315          320
Leu Asp Glu Gln Val Lys Ser Ala Val Thr Glu Phe Gln Asn Val Gln
 325          330          335
Pro Thr Asn Asp Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val
 340          345          350
Tyr Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys
 355          360          365
His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met
 370          375          380

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Glu Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln
 385 390 395 400
 Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Leu
 405 410 415
 Ile Phe Pro Tyr Ile Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys
 420 425 430
 Val His Val Lys Thr Ile Asp Tyr Glu Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460
 Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495
 Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
 500 505 510
 Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
 515 520 525
 Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
 530 535 540
 Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
 545 550 555 560
 Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
 565 570 575
 Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
 580 585 590
 His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
 595 600 605
 Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
 610 615 620
 Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
 625 630 635 640
 Arg Lys Arg Lys Asn
 645

<210> 10

<211> 645

<212> PRT

<213> Artificial Sequence

<220>

<223> Hybrid sequence

<400> 10

Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1 5 10 15
 Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu
 20 25 30
 Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
 35 40 45
 Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50 55 60
 Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65 70 75 80

Val	Ser	Asn	Lys	Glu	Val	Glu	Ala	Pro	Thr	Ser	Glu	Thr	Lys	Glu	Ala	
				85					90					95		
Lys	Glu	Val	Lys	Glu	Val	Lys	Ala	Pro	Lys	Glu	Thr	Lys	Glu	Val	Lys	
			100					105					110			
Pro	Ala	Ala	Lys	Ala	Thr	Asn	Asn	Thr	Tyr	Pro	Ile	Leu	Asn	Gln	Glu	
		115					120					125				
Leu	Arg	Asp	Ala	Ile	Lys	Asn	Pro	Ala	Ile	Lys	Asp	Lys	Glu	His	Thr	
	130					135					140					
Ala	Pro	Asn	Ser	Arg	Pro	Ile	Asp	Phe	Glu	Met	Lys	Lys	Lys	Asp	Gly	
145					150					155					160	
Thr	Gln	Gln	Phe	Tyr	His	Tyr	Ala	Ser	Thr	Val	Lys	Pro	Ala	Arg	Val	
				165					170					175		
Ile	Phe	Thr	Asp	Thr	Lys	Pro	Glu	Ile	Glu	Leu	Gly	Leu	Gln	Thr	Ala	
			180					185					190			
Gln	Phe	Trp	Lys	Lys	Phe	Glu	Val	Tyr	Glu	Gly	Asp	Lys	Lys	Leu	Pro	
		195					200					205				
Val	Lys	Leu	Val	Ser	Tyr	Asp	Ser	Val	Lys	Asp	Tyr	Ala	Tyr	Ile	Arg	
	210					215					220					
Phe	Ser	Val	Ser	Asn	Gly	Thr	Arg	Ala	Val	Lys	Ile	Val	Ser	Ser	Thr	
225					230					235					240	
His	Tyr	Asn	Asn	Lys	Glu	Glu	Lys	Tyr	Asp	Tyr	Thr	Leu	Met	Glu	Phe	
				245					250					255		
Ala	Gln	Pro	Ile	Tyr	Asn	Ser	Ala	Asp	Lys	Tyr	Lys	Thr	Glu	Glu	Asp	
			260					265					270			
Tyr	Lys	Ala	Glu	Lys	Leu	Leu	Ala	Pro	Tyr	Lys	Lys	Ala	Lys	Thr	Leu	
	275						280					285				
Glu	Arg	Gln	Val	Tyr	Glu	Leu	Asn	Lys	Leu	Gln	Asp	Lys	Leu	Pro	Glu	
	290					295					300					
Lys	Leu	Lys	Ala	Glu	Tyr	Lys	Lys	Lys	Leu	Asp	Asp	Thr	Arg	Lys	Ala	
305					310					315					320	
Leu	Asp	Asp	Gln	Val	Lys	Ser	Ala	Val	Thr	Glu	Phe	Gln	Asn	Val	Gln	
			325						330					335		
Pro	Thr	Asn	Asp	Lys	Leu	Thr	Asp	Leu	Gln	Glu	Thr	Lys	Phe	Val	Val	
		340						345					350			
Phe	Glu	Ser	Val	Glu	Asn	Asn	Glu	Ser	Val	Met	Asp	Thr	Phe	Val	Lys	
	355						360					365				
His	Pro	Ile	Lys	Thr	Ala	Met	Leu	Asn	Gly	Lys	Lys	Tyr	Val	Val	Met	
	370					375						380				
Glu	Thr	Thr	Asn	Asp	Asp	Tyr	Trp	Lys	Asp	Phe	Ile	Val	Glu	Gly	Gln	
385					390					395					400	
Arg	Val	Arg	Thr	Val	Ser	Lys	Asp	Ala	Lys	Asn	Asn	Ser	Arg	Thr	Leu	
			405						410					415		
Ile	Phe	Pro	Tyr	Ile	Glu	Gly	Lys	Thr	Val	Tyr	Asp	Ala	Ile	Val	Lys	
		420						425					430			
Val	His	Val	Lys	Thr	Ile	Asp	Tyr	Glu	Gly	Gln	Tyr	His	Val	Arg	Ile	
	435						440						445			
Ile	Asp	Lys	Asp	Ala	Phe	Thr	Lys	Ala	Asn	Thr	Asp	Lys	Ser	Asn	Lys	
	450					455					460					
Lys	Glu	Gln	Gln	Asp	Asn	Ser	Ala	Lys	Lys	Glu	Ala	Thr	Pro	Ala	Thr	
465					470					475					480	
Pro	Ser	Lys	Pro	Thr	Pro	Ser	Pro	Val	Glu	Lys	Glu	Ser	Gln	Lys	Gln	
			485						490					495		
Asp	Ser	Gln	Lys	Asp	Asp	Asn	Lys	Gln	Leu	Pro	Ser	Val	Glu	Lys	Glu	
			500					505					510			

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Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
515                    520                    525
Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
530                    535                    540
Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
545                    550                    555                    560
Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
565                    570                    575
Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
580                    585                    590
His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
595                    600                    605
Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
610                    615                    620
Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
625                    630                    635                    640
Arg Lys Arg Lys Asn
645

```

<210> 11
 <211> 645
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Hybrid sequence

```

<400> 11
Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
1          5          10          15
Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu Leu
20        25        30
Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
35        40        45
Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
50        55        60
Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
65        70        75          80
Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
85        90        95
Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
100       105       110
Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
115       120       125
Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His Ser
130       135       140
Ala Pro Asn Ser Arg Pro Ile Asp Phe Glu Met Lys Lys Lys Asp Gly
145       150       155          160
Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Lys Pro Ala Arg Val
165       170       175
Ile Phe Thr Asp Ser Lys Pro Glu Ile Glu Leu Gly Leu Gln Ser Gly
180       185       190
Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
195       200       205

```

Ile Lys Leu Val Ser Tyr Asp Thr Val Lys Asp Tyr Ala Tyr Ile Arg
 210 215 220
 Phe Ser Val Ser Asn Gly Thr Lys Glu Val Lys Ile Val Ser Ser Thr
 225 230 235 240
 His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Glu Phe
 245 250 255
 Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
 260 265 270
 Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275 280 285
 Glu Arg Gln Val Tyr Glu Leu Asn Lys Ile Gln Asp Lys Leu Pro Glu
 290 295 300
 Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Asp Thr Lys Lys Ala
 305 310 315 320
 Leu Asp Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
 325 330 335
 Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val
 340 345 350
 Tyr Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys
 355 360 365
 His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met
 370 375 380
 Glu Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln
 385 390 395 400
 Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
 405 410 415
 Ile Phe Pro Tyr Val Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys
 420 425 430
 Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460
 Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495
 Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
 500 505 510
 Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
 515 520 525
 Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
 530 535 540
 Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
 545 550 555 560
 Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
 565 570 575
 Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
 580 585 590
 His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
 595 600 605
 Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
 610 615 620
 Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
 625 630 635 640

Arg Lys Arg Lys Asn
645

<210> 12
<211> 645
<212> PRT
<213> Artificial Sequence

<220>
<223> Hybrid sequence

<400> 12
Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
1 5 10 15
Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu Leu
20 25 30
Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
35 40 45
Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
50 55 60
Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
65 70 75 80
Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
85 90 95
Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
100 105 110
Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
115 120 125
Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His Ser
130 135 140
Ala Pro Asn Trp Arg Pro Ile Asp Phe Glu Met Lys Lys Lys Asp Gly
145 150 155 160
Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Glu Pro Ala Arg Val
165 170 175
Ile Phe Thr Asp Ser Lys Pro Glu Ile Glu Leu Gly Leu Gln Ser Gly
180 185 190
Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
195 200 205
Ile Lys Leu Val Ser Tyr Asp Thr Val Lys Asp Tyr Ala Tyr Ile Arg
210 215 220
Phe Ser Val Ser Asn Gly Thr Lys Glu Val Lys Ile Val Ser Ser Thr
225 230 235 240
His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Glu Phe
245 250 255
Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
260 265 270
Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
275 280 285
Glu Arg Gln Val Tyr Glu Leu Asn Lys Ile Gln Asp Lys Leu Pro Glu
290 295 300
Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Asp Thr Lys Lys Ala
305 310 315 320
Leu Asp Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
325 330 335

```

Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val
      340      345      350
Tyr Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys
      355      360      365
His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met
      370      375      380
Glu Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln
385      390      395      400
Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
      405      410      415
Ile Phe Pro Tyr Val Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys
      420      425      430
Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
      435      440      445
Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
      450      455      460
Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
465      470      475      480
Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
      485      490      495
Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
      500      505      510
Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
      515      520      525
Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
      530      535      540
Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
545      550      555      560
Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
      565      570      575
Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
      580      585      590
His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
      595      600      605
Ser Leu Pro Gln Thr Gly Glu Ser Asn Lys Asp Met Thr Leu Pro
610      615      620
Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
625      630      635      640
Arg Lys Arg Lys Asn
      645

```

<210> 13

<211> 645

<212> PRT

<213> Artificial Sequence

<220>

<223> Hybrid sequence

<400> 13

```

Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1      5      10      15
Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu
20      25      30

```

Met	Ser	Asn	Gly	Glu	Ala	Gln	Ala	Ala	Ala	Glu	Glu	Thr	Gly	Gly	Thr
		35					40					45			
Asn	Thr	Glu	Ala	Gln	Pro	Lys	Thr	Glu	Ala	Val	Ala	Ser	Pro	Thr	Thr
	50					55					60				
Thr	Ser	Glu	Lys	Ala	Pro	Glu	Thr	Lys	Pro	Val	Ala	Asn	Ala	Val	Ser
65					70					75					80
Val	Ser	Asn	Lys	Glu	Val	Glu	Ala	Pro	Thr	Ser	Glu	Thr	Lys	Glu	Ala
			85						90					95	
Lys	Glu	Val	Lys	Glu	Val	Lys	Ala	Pro	Lys	Glu	Thr	Lys	Glu	Val	Lys
			100					105					110		
Pro	Ala	Ala	Lys	Ala	Thr	Asn	Asn	Thr	Tyr	Pro	Ile	Leu	Asn	Gln	Glu
		115					120					125			
Leu	Arg	Glu	Ala	Ile	Lys	Asn	Pro	Ala	Ile	Lys	Asp	Lys	Asp	His	Ser
	130					135					140				
Ala	Pro	Asn	Trp	Arg	Pro	Ile	Asp	Phe	Glu	Met	Lys	Lys	Lys	Asp	Gly
145					150					155					160
Thr	Gln	Gln	Phe	Tyr	His	Tyr	Ala	Ser	Ser	Val	Glu	Pro	Ala	Arg	Val
			165						170					175	
Ile	Phe	Thr	Asp	Ser	Lys	Pro	Glu	Ile	Glu	Leu	Gly	Leu	Gln	Ser	Gly
			180					185					190		
Gln	Phe	Trp	Arg	Lys	Phe	Glu	Val	Tyr	Glu	Gly	Asp	Lys	Lys	Leu	Pro
	195						200					205			
Ile	Lys	Leu	Val	Ser	Tyr	Asp	Thr	Val	Lys	Asp	Tyr	Ala	Tyr	Ile	Arg
	210					215					220				
Phe	Ser	Val	Ser	Asn	Gly	Thr	Lys	Ala	Val	Lys	Ile	Val	Ser	Ser	Thr
225					230					235					240
His	Phe	Asn	Asn	Lys	Glu	Glu	Lys	Tyr	Asp	Tyr	Thr	Leu	Met	Glu	Phe
				245					250					255	
Ala	Gln	Pro	Ile	Tyr	Asn	Ser	Ala	Asp	Lys	Phe	Lys	Thr	Glu	Glu	Asp
			260					265					270		
Tyr	Lys	Ala	Glu	Lys	Leu	Leu	Ala	Pro	Tyr	Lys	Lys	Ala	Lys	Thr	Leu
		275					280					285			
Glu	Arg	Gln	Val	Tyr	Glu	Leu	Glu	Lys	Ile	Gln	Asp	Lys	Leu	Pro	Glu
	290					295					300				
Lys	Leu	Lys	Ala	Glu	Tyr	Lys	Lys	Lys	Leu	Glu	Asp	Thr	Lys	Lys	Ala
305					310					315					320
Leu	Asp	Glu	Gln	Val	Lys	Ser	Ala	Ile	Thr	Glu	Phe	Gln	Asn	Val	Gln
				325					330					335	
Pro	Thr	Asn	Glu	Lys	Met	Thr	Asp	Leu	Gln	Asp	Thr	Lys	Tyr	Val	Val
			340					345					350		
Tyr	Glu	Ser	Val	Glu	Asn	Asn	Glu	Ser	Met	Met	Asp	Thr	Phe	Val	Lys
		355					360					365			
His	Pro	Ile	Lys	Thr	Gly	Met	Leu	Asn	Gly	Lys	Lys	Tyr	Met	Val	Met
	370					375					380				
Glu	Thr	Thr	Asn	Asp	Asp	Tyr	Trp	Lys	Asp	Phe	Met	Val	Glu	Gly	Gln
385					390					395					400
Arg	Val	Arg	Thr	Ile	Ser	Lys	Asp	Ala	Lys	Asn	Asn	Thr	Arg	Thr	Ile
				405					410					415	
Ile	Phe	Pro	Tyr	Val	Glu	Gly	Lys	Thr	Leu	Tyr	Asp	Ala	Ile	Val	Lys
			420					425					430		
Val	His	Val	Lys	Thr	Ile	Asp	Tyr	Asp	Gly	Gln	Tyr	His	Val	Arg	Ile
		435					440					445			
Val	Asp	Lys	Glu	Ala	Phe	Thr	Lys	Ala	Asn	Thr	Asp	Lys	Ser	Asn	Lys
	450					455					460				

Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495
 Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
 500 505 510
 Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
 515 520 525
 Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
 530 535 540
 Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
 545 550 555 560
 Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
 565 570 575
 Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
 580 585 590
 His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
 595 600 605
 Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
 610 615 620
 Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
 625 630 635 640
 Arg Lys Arg Lys Asn
 645

<210> 14

<211> 645

<212> PRT

<213> Artificial Sequence

<220>

<223> Hybrid sequence

<400> 14

Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1 5 10 15
 Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu
 20 25 30
 Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
 35 40 45
 Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50 55 60
 Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65 70 75 80
 Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
 85 90 95
 Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
 100 105 110
 Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
 115 120 125
 Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His Ser
 130 135 140
 Ala Pro Asn Trp Arg Pro Ile Asp Phe Glu Met Lys Lys Lys Asp Gly
 145 150 155 160

```

Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Glu Pro Ala Arg Val
      165      170      175
Ile Phe Thr Asp Ser Lys Pro Glu Ile Glu Leu Gly Leu Gln Ser Gly
      180      185      190
Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
      195      200      205
Ile Lys Leu Val Ser Tyr Asp Thr Val Lys Asp Tyr Ala Tyr Ile Arg
      210      215      220
Phe Ser Val Ser Asn Gly Thr Lys Glu Val Lys Ile Val Ser Ser Thr
      225      230      235      240
His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Val Phe
      245      250      255
Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
      260      265      270
Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
      275      280      285
Glu Arg Gln Val Tyr Glu Leu Asn Lys Ile Gln Asp Lys Leu Pro Glu
      290      295      300
Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Asp Thr Lys Lys Ala
      305      310      315      320
Leu Ala Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
      325      330      335
Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val
      340      345      350
Tyr Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys
      355      360      365
His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met
      370      375      380
Glu Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln
      385      390      395      400
Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
      405      410      415
Ile Phe Pro Tyr Val Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys
      420      425      430
Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
      435      440      445
Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
      450      455      460
Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
      465      470      475      480
Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
      485      490      495
Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
      500      505      510
Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
      515      520      525
Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
      530      535      540
Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
      545      550      555      560
Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
      565      570      575
Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
      580      585      590

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His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
 595 600 605
 Ser Leu Pro Gln Thr Gly Glu Ser Asn Lys Asp Met Thr Leu Pro
 610 615 620
 Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
 625 630 635 640
 Arg Lys Arg Lys Asn
 645

<210> 15
 <211> 645
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Hybrid sequence

<400> 15
 Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1 5 10 15
 Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu
 20 25 30
 Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
 35 40 45
 Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50 55 60
 Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65 70 75 80
 Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
 85 90 95
 Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
 100 105 110
 Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
 115 120 125
 Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His Ser
 130 135 140
 Ala Pro Asn Trp Arg Pro Ile Asp Phe Glu Met Lys Lys Lys Asp Gly
 145 150 155 160
 Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Glu Pro Ala Arg Val
 165 170 175
 Ile Phe Thr Asp Ser Lys Pro Glu Ile Glu Leu Gly Leu Gln Ser Gly
 180 185 190
 Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
 195 200 205
 Ile Lys Leu Val Ser Tyr Asp Thr Val Lys Asp Tyr Ala Tyr Ile Arg
 210 215 220
 Phe Ser Val Ser Asn Gly Thr Lys Glu Val Lys Ile Val Ser Ser Thr
 225 230 235 240
 His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Glu Phe
 245 250 255
 Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
 260 265 270
 Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275 280 285

Glu Arg Gln Val Tyr Glu Leu Glu Lys Ile Gln Asp Lys Leu Pro Glu
 290 295 300
 Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Asp Thr Lys Lys Ala
 305 310 315 320
 Leu Ala Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
 325 330 335
 Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val
 340 345 350
 Tyr Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys
 355 360 365
 His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met
 370 375 380
 Glu Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln
 385 390 395 400
 Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
 405 410 415
 Ile Phe Pro Tyr Val Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys
 420 425 430
 Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460
 Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495
 Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
 500 505 510
 Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
 515 520 525
 Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
 530 535 540
 Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
 545 550 555 560
 Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
 565 570 575
 Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
 580 585 590
 His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
 595 600 605
 Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
 610 615 620
 Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
 625 630 635 640
 Arg Lys Arg Lys Asn
 645

<210> 16

<211> 645

<212> PRT

<213> Artificial Sequence

<220>

<223> Hybrid sequence

<400> 16

```

Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1          5          10          15
Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu Leu
 20          25          30
Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
 35          40          45
Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50          55          60
Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65          70          75          80
Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
 85          90          95
Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
100          105          110
Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
115          120          125
Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His Ser
130          135          140
Ala Pro Asn Trp Arg Pro Ile Asp Phe Glu Met Lys Lys Lys Asp Gly
145          150          155          160
Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Glu Pro Ala Arg Val
165          170          175
Ile Phe Thr Lys Ser Lys Pro Glu Ile Glu Leu Gly Leu Gln Ser Gly
180          185          190
Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
195          200          205
Ile Lys Leu Val Ser Tyr Asp Thr Asp Lys Asp Tyr Ala Tyr Ile Arg
210          215          220
Phe Ser Val Ser Asn Gly Thr Lys Glu Val Lys Ile Val Ser Ser Thr
225          230          235          240
His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Glu Phe
245          250          255
Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
260          265          270
Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
275          280          285
Glu Arg Gln Val Tyr Glu Leu Glu Lys Ile Gln Asp Lys Leu Pro Glu
290          295          300
Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Asp Thr Lys Lys Ala
305          310          315          320
Leu Ala Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
325          330          335
Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val
340          345          350
Tyr Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys
355          360          365
His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met
370          375          380
Glu Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln
385          390          395          400
Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
405          410          415
Ile Phe Pro Tyr Val Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys
420          425          430

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Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460
 Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495
 Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
 500 505 510
 Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
 515 520 525
 Pro Thr Lys Gly Glu Val Glu Ser Ser Thr Thr Pro Thr Lys Val
 530 535 540
 Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
 545 550 555 560
 Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
 565 570 575
 Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
 580 585 590
 His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
 595 600 605
 Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
 610 615 620
 Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
 625 630 635 640
 Arg Lys Arg Lys Asn
 645

<210> 17

<211> 645

<212> PRT

<213> Artificial Sequence

<220>

<223> Hybrid sequence

<400> 17

Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1 5 10 15
 Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu Leu
 20 25 30
 Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
 35 40 45
 Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50 55 60
 Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65 70 75 80
 Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
 85 90 95
 Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
 100 105 110
 Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
 115 120 125

Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His Ser
 130 135 140
 Ala Pro Asn Trp Arg Pro Ile Asp Phe Glu Met Lys Lys Lys Asp Gly
 145 150 155 160
 Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Glu Pro Ala Arg Val
 165 170 175
 Ile Phe Thr Lys Ser Lys Pro Glu Ile Glu Leu Gly Leu Gln Ser Gly
 180 185 190
 Ser Thr Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
 195 200 205
 Ile Lys Leu Val Ser Tyr Asp Thr Asp Lys Asp Tyr Ala Tyr Ile Arg
 210 215 220
 Phe Ser Val Ser Asn Gly Thr Lys Glu Val Lys Ile Val Ser Ser Thr
 225 230 235 240
 His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Val Phe
 245 250 255
 Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
 260 265 270
 Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275 280 285
 Glu Arg Gln Val Tyr Glu Leu Glu Lys Ile Gln Asp Lys Leu Pro Glu
 290 295 300
 Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Asp Thr Lys Lys Ala
 305 310 315 320
 Leu Ala Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
 325 330 335
 Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val
 340 345 350
 Tyr Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys
 355 360 365
 His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met
 370 375 380
 Glu Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln
 385 390 395 400
 Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
 405 410 415
 Ile Phe Pro Tyr Val Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys
 420 425 430
 Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460
 Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495
 Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
 500 505 510
 Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
 515 520 525
 Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
 530 535 540
 Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
 545 550 555 560

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<210> 18
<211> 645
<212> PRT
<213> Artificial Sequence
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<220>
<223> Hybrid sequence

- 30 -

Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
 260 265 270
 Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275 280 285
 Glu Arg Gln Val Tyr Glu Leu Glu Lys Ile Gln Asp Lys Leu Pro Glu
 290 295 300
 Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Asp Thr Lys Lys Ala
 305 310 315 320
 Leu Ala Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
 325 330 335
 Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val
 340 345 350
 Tyr Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys
 355 360 365
 His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met
 370 375 380
 Glu Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln
 385 390 395 400
 Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
 405 410 415
 Ile Phe Pro Tyr Val Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys
 420 425 430
 Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460
 Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495
 Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
 500 505 510
 Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
 515 520 525
 Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
 530 535 540
 Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
 545 550 555 560
 Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
 565 570 575
 Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
 580 585 590
 His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
 595 600 605
 Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
 610 615 620
 Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
 625 630 635 640
 Arg Lys Arg Lys Asn
 645

<210> 19

<211> 645

<212> PRT

<213> Artificial Sequence

<220>

<223> Hybrid sequence

<400> 19

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Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1           5           10           15
Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu Leu
          20           25           30
Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
 35           40           45
Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50           55           60
Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
65           70           75           80
Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
          85           90           95
Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
100           105           110
Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
115           120           125
Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His Ser
130           135           140
Ala Pro Asn Trp Arg Pro Ile Asp Phe Glu Met Lys Asn Asp Lys Gly
145           150           155           160
Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Glu Pro Ala Arg Val
          165           170           175
Ile Phe Thr Lys Ser Lys Pro Ile Ile Glu Leu Gly Leu Gln Ser Gly
180           185           190
Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
195           200           205
Ile Lys Leu Val Ser Tyr Asp Thr Asp Lys Asp Tyr Ala Tyr Ile Arg
210           215           220
Phe Ser Val Ser Asn Gly Thr Lys Glu Val Lys Ile Val Ser Ser Thr
225           230           235           240
His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Val Phe
          245           250           255
Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
260           265           270
Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
275           280           285
Glu Arg Gln Val Tyr Glu Leu Glu Lys Ile Gln Asp Lys Leu Pro Glu
290           295           300
Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Gln Thr Lys Lys Ala
305           310           315           320
Leu Ala Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
          325           330           335
Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Ala His Tyr Val Val
340           345           350
Tyr Glu Ser Val Glu Asn Ser Glu Ser Met Met Asp Thr Phe Val Lys
355           360           365
His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met
370           375           380
Glu Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln
385           390           395           400

```



```

Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
              405              410              415
Ile Phe Pro Tyr Val Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys
              420              425              430
Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
              435              440              445
Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
              450              455              460
Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
465              470              475              480
Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
              485              490              495
Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
              500              505              510
Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
              515              520              525
Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
530              535              540
Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
545              550              555              560
Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
              565              570              575
Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
              580              585              590
His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
595              600              605
Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
610              615              620
Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
625              630              635              640
Arg Lys Arg Lys Asn
              645

```

<210> 20

<211> 645

<212> PRT

<213> Artificial Sequence

<220>

<223> Hybrid sequence

<400> 20

```

Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1              5              10              15
Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu
              20              25              30
Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
              35              40              45
Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
50              55              60
Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
65              70              75              80
Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
              85              90              95

```

Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
 100 105 110
 Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
 115 120 125
 Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His Ser
 130 135 140
 Ala Pro Asn Trp Arg Pro Ile Asp Phe Glu Met Lys Asn Asp Lys Gly
 145 150 155 160
 Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Glu Pro Ala Arg Val
 165 170 175
 Ile Phe Thr Lys Ser Lys Pro Ile Ile Glu Leu Gly Leu Gln Ser Gly
 180 185 190
 Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
 195 200 205
 Ile Lys Leu Val Ser Tyr Asp Thr Asp Lys Asp Tyr Ala Tyr Ile Arg
 210 215 220
 Phe Ser Val Ser Asn Gly Thr Lys Glu Val Lys Ile Val Ser Ser Thr
 225 230 235 240
 His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Val Phe
 245 250 255
 Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
 260 265 270
 Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275 280 285
 Glu Arg Gln Val Tyr Glu Leu Glu Lys Ile Gln Asp Lys Leu Pro Glu
 290 295 300
 Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Gln Thr Lys Lys Ala
 305 310 315 320
 Leu Ala Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
 325 330 335
 Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Ala His Tyr Val Val
 340 345 350
 Tyr Glu Ser Val Glu Asn Ser Glu Ser Met Met Asp Thr Phe Val Lys
 355 360 365
 His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met
 370 375 380
 Lys Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Lys
 385 390 395 400
 Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
 405 410 415
 Ile Phe Pro Tyr Val Glu Gly Lys Ala Leu Tyr Asp Ala Ile Val Lys
 420 425 430
 Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460
 Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495
 Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
 500 505 510
 Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
 515 520 525

```

Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
  530                      535                      540
Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
545                      550                      555                      560
Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
                      565                      570                      575
Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
                      580                      585                      590
His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
                      595                      600                      605
Ser Leu Pro Gln Thr Gly Glu Ser Asn Lys Asp Met Thr Leu Pro
                      610                      615                      620
Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
625                      630                      635                      640
Arg Lys Arg Lys Asn
                      645

```

<210> 21

<211> 645

<212> PRT

<213> Artificial Sequence

<220>

<223> Hybrid sequence

<400> 21

```

Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
  1                      5                      10                      15
Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu
                      20                      25                      30
Met Ser Asn Gly Glu Ala Gln Ala Ala Ala Glu Glu Thr Gly Gly Thr
                      35                      40                      45
Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
                      50                      55                      60
Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
65                      70                      75                      80
Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
                      85                      90                      95
Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
                      100                      105                      110
Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
                      115                      120                      125
Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His Ser
130                      135                      140
Ala Pro Asn Trp Arg Pro Ile Asp Phe Glu Met Lys Asn Asp Lys Gly
145                      150                      155                      160
Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Glu Pro Ala Arg Val
                      165                      170                      175
Ile Phe Thr Lys Ser Lys Pro Ile Ile Glu Leu Gly Leu Gln Ser Gly
                      180                      185                      190
Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
195                      200                      205
Ile Lys Leu Val Ser Tyr Asp Thr Asp Lys Asp Tyr Ala Tyr Ile Arg
210                      215                      220

```

Phe Ser Val Ser Asn Gly Thr Lys Glu Val Lys Ile Val Ser Ser Thr
 225 230 235 240
 His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Val Phe
 245 250 255
 Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
 260 265 270
 Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275 280 285
 Glu Arg Gln Val Tyr Glu Leu Glu Lys Ile Gln Asp Lys Leu Pro Glu
 290 295 300
 Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Gln Thr Lys Lys Ala
 305 310 315 320
 Leu Ala Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
 325 330 335
 Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Ala His Tyr Val Val
 340 345 350
 Tyr Glu Ser Val Glu Asn Ser Glu Ser Met Met Asp Thr Phe Val Lys
 355 360 365
 His Pro Ile Lys Thr Gly Thr Leu Asn Gly Lys Lys Tyr Met Val Met
 370 375 380
 Lys Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Lys
 385 390 395 400
 Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
 405 410 415
 Ile Phe Pro Tyr Val Glu Gly Lys Ala Leu Tyr Asp Ala Ile Val Lys
 420 425 430
 Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460
 Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495
 Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
 500 505 510
 Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
 515 520 525
 Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
 530 535 540
 Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
 545 550 555 560
 Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
 565 570 575
 Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
 580 585 590
 His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
 595 600 605
 Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
 610 615 620
 Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
 625 630 635 640
 Arg Lys Arg Lys Asn
 645

<210> 22
 <211> 645
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Hybrid sequence

<400> 22

Met	Asn	Lys	Gln	Gln	Lys	Glu	Phe	Lys	Ser	Phe	Tyr	Ser	Ile	Arg	Lys
1				5					10					15	
Ser	Ser	Leu	Gly	Val	Ala	Ser	Val	Ala	Ile	Ser	Thr	Leu	Leu	Leu	
			20					25					30		
Met	Ser	Asn	Gly	Glu	Ala	Gln	Ala	Ala	Ala	Glu	Glu	Thr	Gly	Gly	Thr
		35					40					45			
Asn	Thr	Glu	Ala	Gln	Pro	Lys	Thr	Glu	Ala	Val	Ala	Ser	Pro	Thr	Thr
	50					55					60				
Thr	Ser	Glu	Lys	Ala	Pro	Glu	Thr	Lys	Pro	Val	Ala	Asn	Ala	Val	Ser
65					70					75				80	
Val	Ser	Asn	Lys	Glu	Val	Glu	Ala	Pro	Thr	Ser	Glu	Thr	Lys	Glu	Ala
			85						90					95	
Lys	Glu	Val	Lys	Glu	Val	Lys	Ala	Pro	Lys	Glu	Thr	Lys	Glu	Val	Lys
			100					105					110		
Pro	Ala	Ala	Lys	Ala	Thr	Asn	Asn	Thr	Tyr	Pro	Ile	Leu	Asn	Gln	Glu
	115						120					125			
Leu	Arg	Glu	Ala	Ile	Lys	Asn	Pro	Ala	Ile	Lys	Asp	Lys	Asp	His	Ser
	130					135					140				
Ala	Pro	Asn	Trp	Arg	Pro	Ile	Asp	Phe	Glu	Met	Lys	Asn	Asp	Lys	Gly
145					150					155				160	
Thr	Gln	Gln	Phe	Tyr	His	Tyr	Ala	Ser	Ser	Val	Glu	Pro	Ala	Arg	Val
			165						170					175	
Ile	Phe	Thr	Lys	Ser	Lys	Pro	Ile	Ile	Glu	Leu	Gly	Leu	Gln	Ser	Gly
			180					185					190		
Gln	Phe	Trp	Arg	Lys	Phe	Glu	Val	Tyr	Glu	Gly	Asp	Lys	Lys	Leu	Pro
	195						200					205			
Ile	Lys	Leu	Val	Ser	Tyr	Asp	Thr	Asp	Lys	Asp	Tyr	Ala	Tyr	Ile	Arg
	210					215					220				
Phe	Ser	Val	Ser	Asn	Gly	Thr	Lys	Glu	Val	Lys	Ile	Val	Ser	Ser	Thr
225					230					235				240	
His	Phe	Asn	Asn	Lys	Glu	Glu	Lys	Tyr	Asp	Tyr	Thr	Leu	Met	Val	Phe
			245						250					255	
Ala	Gln	Pro	Ile	Tyr	Asn	Ser	Ala	Asp	Lys	Phe	Lys	Thr	Glu	Glu	Asp
		260						265					270		
Tyr	Lys	Ala	Glu	Lys	Leu	Leu	Ala	Pro	Tyr	Lys	Lys	Ala	Lys	Thr	Leu
	275						280					285			
Glu	Arg	Gln	Val	Tyr	Glu	Leu	Glu	Lys	Ile	Gln	Asp	Lys	Leu	Pro	Glu
	290					295					300				
Lys	Leu	Lys	Ala	Glu	Tyr	Lys	Lys	Lys	Leu	Glu	Gln	Thr	Lys	Lys	Ala
305					310					315				320	
Leu	Ala	Glu	Gln	Val	Lys	Ser	Ala	Ile	Thr	Glu	Phe	Gln	Asn	Val	Gln
			325						330					335	
Pro	Thr	Asn	Glu	Lys	Met	Thr	Asp	Leu	Gln	Asp	Ala	His	Tyr	Val	Val
		340						345					350		
Tyr	Glu	Ser	Val	Glu	Asn	Ser	Glu	Ser	Met	Met	Asp	Thr	Phe	Val	Glu
	355						360					365			

```

His Pro Ile Lys Thr Gly Thr Leu Asn Gly Lys Lys Tyr Met Val Met
 370                               375                               380
Lys Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Lys
385                               390                               395                               400
Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
                               405                               410                               415
Ile Phe Pro Tyr Val Glu Gly Lys Ala Leu Tyr Asp Ala Ile Val Lys
                               420                               425                               430
Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
                               435                               440                               445
Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
                               450                               455                               460
Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
465                               470                               475                               480
Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
                               485                               490                               495
Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
                               500                               505                               510
Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
                               515                               520                               525
Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
                               530                               535                               540
Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
545                               550                               555                               560
Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
                               565                               570                               575
Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
                               580                               585                               590
His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
                               595                               600                               605
Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
610                               615                               620
Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
625                               630                               635                               640
Arg Lys Arg Lys Asn
                               645

```

<210> 23

<211> 645

<212> PRT

<213> Artificial Sequence

<220>

<223> Hybrid sequence

<400> 23

```

Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1                               5                               10                               15
Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu Leu
                               20                               25                               30
Met Ser Asn Gly Glu Ala Gln Ala Ala Ala Glu Glu Thr Gly Gly Thr
                               35                               40                               45
Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
50                               55                               60

```

Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65 70 75 80
 Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
 85 90 95
 Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
 100 105 110
 Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
 115 120 125
 Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Ile Asp Lys Asp His Ser
 130 135 140
 Ala Pro Asn Trp Arg Pro Ile Asp Phe Glu Met Lys Asn Asp Lys Gly
 145 150 155 160
 Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Glu Pro Ala Arg Val
 165 170 175
 Ile Phe Thr Lys Ser Lys Pro Ile Ile Glu Leu Gly Leu Gln Ser Gly
 180 185 190
 Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
 195 200 205
 Ile Lys Leu Val Ser Tyr Asp Thr Asp Lys Asp Tyr Ala Tyr Ile Arg
 210 215 220
 Phe Ser Val Ser Asn Gly Thr Lys Glu Val Lys Ile Val Ser Ser Thr
 225 230 235 240
 His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Val Phe
 245 250 255
 Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
 260 265 270
 Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275 280 285
 Glu Arg Gln Val Tyr Glu Leu Glu Lys Ile Gln Asp Lys Leu Pro Glu
 290 295 300
 Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Gln Thr Lys Lys Ala
 305 310 315 320
 Leu Ala Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
 325 330 335
 Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Ala His Tyr Val Val
 340 345 350
 Tyr Glu Ser Val Glu Asn Ser Glu Ser Met Met Asp Thr Phe Val Glu
 355 360 365
 His Pro Ile Lys Thr Gly Thr Leu Asn Gly Lys Lys Tyr Met Val Met
 370 375 380
 Lys Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Lys
 385 390 395 400
 Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
 405 410 415
 Ile Phe Pro Tyr Val Glu Gly Lys Ala Leu Tyr Asp Ala Ile Val Lys
 420 425 430
 Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460
 Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495

```

Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
      500      505      510
Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
      515      520      525
Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
      530      535      540
Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
545      550      555      560
Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
      565      570      575
Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
      580      585      590
His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
      595      600      605
Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
      610      615      620
Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
625      630      635      640
Arg Lys Arg Lys Asn
      645

```

<210> 24

<211> 645

<212> PRT

<213> Artificial Sequence

<220>

<223> Hybrid sequence

<400> 24

```

Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1      5      10      15
Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu Leu
      20      25      30
Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
      35      40      45
Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
      50      55      60
Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
65      70      75      80
Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
      85      90      95
Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
      100      105      110
Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
      115      120      125
Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Ile Asp Lys Asp His Ser
      130      135      140
Ala Pro Asn Trp Arg Pro Ile Asp Phe Glu Met Lys Asn Asp Lys Gly
145      150      155      160
Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Glu Pro Ala Arg Val
      165      170      175
Ile Phe Thr Lys Ser Lys Pro Ile Ile Glu Leu Gly Leu Gln Ser Gly
      180      185      190

```


Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
 195 200 205
 Ile Lys Leu Val Ser Tyr Asp Thr Asp Lys Asp Tyr Ala Tyr Ile Arg
 210 215 220
 Phe Ser Val Ser Asn Gly Thr Lys Glu Val Lys Ile Val Ser Ser Thr
 225 230 235 240
 His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Val Phe
 245 250 255
 Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
 260 265 270
 Tyr Asn Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275 280 285
 Glu Arg Gln Val Tyr Glu Leu Glu Lys Ile Gln Asp Lys Leu Pro Glu
 290 295 300
 Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Gln Thr Lys Lys Ala
 305 310 315 320
 Leu Ala Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
 325 330 335
 Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Ala His Tyr Val Val
 340 345 350
 Tyr Glu Ser Val Glu Asn Ser Glu Ser Met Met Asp Thr Phe Val Glu
 355 360 365
 His Pro Ile Lys Thr Gly Thr Leu Asn Gly Lys Lys Tyr Met Val Met
 370 375 380
 Lys Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Lys
 385 390 395 400
 Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
 405 410 415
 Ile Phe Pro Tyr Val Glu Gly Lys Ala Leu Tyr Asp Ala Ile Val Lys
 420 425 430
 Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460
 Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495
 Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
 500 505 510
 Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
 515 520 525
 Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
 530 535 540
 Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
 545 550 555 560
 Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
 565 570 575
 Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
 580 585 590
 His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
 595 600 605
 Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
 610 615 620

Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
 625 630 635 640
 Arg Lys Arg Lys Asn
 645

<210> 25
 <211> 645
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Hybrid sequence

<400> 25
 Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1 5 10 15
 Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu Leu
 20 25 30
 Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
 35 40 45
 Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50 55 60
 Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65 70 75 80
 Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
 85 90 95
 Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
 100 105 110
 Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
 115 120 125
 Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Ile Asp Lys Asp His Ser
 130 135 140
 Ala Pro Asn Trp Arg Pro Ile Asp Phe Glu Met Lys Asn Asp Lys Gly
 145 150 155 160
 Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Glu Pro Ala Arg Val
 165 170 175
 Ile Phe Thr Lys Ser Lys Pro Ile Ile Glu Leu Gly Leu Gln Ser Gly
 180 185 190
 Ser Thr Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
 195 200 205
 Ile Lys Leu Val Ser Tyr Asp Thr Asp Lys Asp Tyr Ala Tyr Ile Arg
 210 215 220
 Phe Ser Val Ser Asn Gly Thr Lys Glu Val Lys Ile Val Ser Ser Thr
 225 230 235 240
 His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Val Phe
 245 250 255
 Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
 260 265 270
 Tyr Asn Leu Gln Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275 280 285
 Glu Arg Gln Val Tyr Glu Leu Glu Lys Ile Gln Asp Lys Leu Pro Glu
 290 295 300
 Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Gln Thr Lys Lys Ala
 305 310 315 320

```
<400> 26
Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1             5             10             15
```

Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu Leu
 20 25 30
 Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
 35 40 45
 Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50 55 60
 Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65 70 75 80
 Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
 85 90 95
 Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
 100 105 110
 Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
 115 120 125
 Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Ile Asp Lys Asp His Ser
 130 135 140
 Ala Pro Asn Trp Arg Pro Ile Asp Phe Glu Met Lys Asn Asp Lys Gly
 145 150 155 160
 Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Glu Pro Ala Arg Val
 165 170 175
 Ile Phe Thr Lys Ser Lys Pro Ile Ile Glu Leu Gly Leu Gln Ser Gly
 180 185 190
 Ser Thr Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
 195 200 205
 Ile Lys Leu Val Ser Tyr Asp Thr Asp Lys Asp Tyr Ala Tyr Ile Arg
 210 215 220
 Phe Ser Val Ser Asn Gly Thr Lys Glu Val Lys Ile Val Ser Ser Thr
 225 230 235 240
 His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Val Phe
 245 250 255
 Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
 260 265 270
 Tyr Asn Leu Gln Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275 280 285
 Glu Arg Gln Val Tyr Glu Leu Glu Lys Ile Gln Asp Lys Leu Pro Glu
 290 295 300
 Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Gln Thr Lys Lys Ala
 305 310 315 320
 Leu Ala Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
 325 330 335
 Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Ala His Tyr Val Val
 340 345 350
 Tyr Glu Ser Val Glu Asn Ser Glu Ser Met Met Asp Thr Phe Val Glu
 355 360 365
 His Pro Ile Lys Thr Gly Thr Leu Asn Gly Lys Lys Tyr Met Val Met
 370 375 380
 Lys Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Lys
 385 390 395 400
 Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
 405 410 415
 Ile Phe Pro Tyr Val Glu Gly Lys Ala Leu Tyr Asp Ala Ile Val Lys
 420 425 430
 Val Val Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445

```

Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
  450                      455                      460
Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
465                      470                      475                      480
Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
                      485                      490                      495
Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
                      500                      505                      510
Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
                      515                      520                      525
Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
                      530                      535                      540
Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
545                      550                      555                      560
Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
                      565                      570                      575
Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
                      580                      585                      590
His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
                      595                      600                      605
Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
610                      615                      620
Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
625                      630                      635                      640
Arg Lys Arg Lys Asn
                      645

```

<210> 27

<211> 645

<212> PRT

<213> Artificial Sequence

<220>

<223> Hybrid sequence

<400> 27

```

Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
  1                      5                      10                      15
Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu Leu
                      20                      25                      30
Met Ser Asn Gly Glu Ala Gln Ala Ala Ala Glu Glu Thr Gly Gly Thr
                      35                      40                      45
Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
50                      55                      60
Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
65                      70                      75                      80
Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
                      85                      90                      95
Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
                      100                      105                      110
Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
                      115                      120                      125
Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Ile Asp Lys Asp His Ser
130                      135                      140

```

Ala Pro Asn Trp Arg Pro Ile Asp Phe Glu Met Lys Asn Asp Lys Gly
 145 150 155 160
 Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Glu Pro Ala Arg Val
 165 170 175
 Ile Phe Thr Lys Ser Lys Pro Ile Ile Glu Leu Gly Leu Gln Ser Gly
 180 185 190
 Ser Thr Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
 195 200 205
 Ile Lys Leu Val Ser Tyr Asp Thr Asp Lys Asp Tyr Ala Tyr Ile Arg
 210 215 220
 Phe Ser Val Ser Asn Gly Thr Lys Glu Val Lys Ile Val Ser Ser Thr
 225 230 235 240
 His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Val Phe
 245 250 255
 Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
 260 265 270
 Tyr Asn Leu Gln Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275 280 285
 Glu Arg Gln Val Tyr Glu Leu Glu Lys Ile Gln Asp Lys Leu Pro Glu
 290 295 300
 Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Gln Thr Lys Lys Ala
 305 310 315 320
 Leu Ala Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
 325 330 335
 Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Ala His Tyr Val Val
 340 345 350
 Tyr Glu Ser Val Glu Asn Ser Glu Ser Met Met Asp Thr Phe Val Glu
 355 360 365
 His Pro Ile Lys Thr Gly Thr Leu Asn Gly Lys Lys Tyr Met Val Met
 370 375 380
 Lys Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Lys
 385 390 395 400
 Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
 405 410 415
 Ile Phe Pro Tyr Val Glu Gly Lys Ala Leu Tyr Asp Ala Ile Val Lys
 420 425 430
 Val Val Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ile Asn Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460
 Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495
 Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
 500 505 510
 Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
 515 520 525
 Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
 530 535 540
 Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
 545 550 555 560
 Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
 565 570 575

Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
 580 585 590
 His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
 595 600 605
 Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
 610 615 620
 Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
 625 630 635 640
 Arg Lys Arg Lys Asn
 645

<210> 28
 <211> 645
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Hybrid sequence

<400> 28
 Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1 5 10 15
 Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu Leu
 20 25 30
 Met Ser Asn Gly Glu Ala Gln Ala Ala Ala Glu Glu Thr Gly Gly Thr
 35 40 45
 Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50 55 60
 Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65 70 75 80
 Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
 85 90 95
 Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
 100 105 110
 Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
 115 120 125
 Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Ile Asp Lys Asp His Ser
 130 135 140
 Ala Pro Asn Trp Arg Pro Ile Asp Phe Glu Met Lys Asn Asp Lys Gly
 145 150 155 160
 Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Glu Pro Ala Arg Val
 165 170 175
 Ile Phe Thr Lys Ser Lys Pro Ile Ile Glu Leu Gly Leu Gln Ser Gly
 180 185 190
 Ser Thr Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
 195 200 205
 Ile Lys Leu Val Ser Tyr Asp Thr Asp Lys Asp Tyr Ala Tyr Ile Arg
 210 215 220
 Phe Ser Val Ser Asn Gly Thr Lys Glu Val Lys Ile Val Ser Ser Thr
 225 230 235 240
 His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Val Phe
 245 250 255
 Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
 260 265 270

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Tyr Asn Leu Gln Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
    275                280                285
Glu Arg Leu Gln Val Tyr Glu Leu Glu Lys Ile Gln Asp Lys Leu Pro Glu
    290                295                300
Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Gln Thr Lys Lys Ala
    305                310                315                320
Leu Ala Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
    325                330                335
Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Ala His Tyr Val Val
    340                345                350
Tyr Glu Ser Val Glu Asn Ser Glu Ser Met Met Asp Thr Phe Val Glu
    355                360                365
His Pro Ile Lys Thr Gly Thr Leu Asn Gly Lys Lys Tyr Met Val Met
    370                375                380
Lys Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Lys
    385                390                395                400
Arg Val Arg Thr Ile Ser Lys Asp Pro Lys Asn Asn Thr Arg Thr Ile
    405                410                415
Ile Phe Pro Tyr Val Glu Gly Lys Ala Leu Tyr Asp Ala Ile Val Lys
    420                425                430
Val Val Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
    435                440                445
Val Asp Lys Glu Ile Asn Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
    450                455                460
Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
    465                470                475                480
Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
    485                490                495
Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
    500                505                510
Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
    515                520                525
Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
    530                535                540
Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
    545                550                555                560
Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
    565                570                575
Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
    580                585                590
His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
    595                600                605
Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
    610                615                620
Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
    625                630                635                640
Arg Lys Arg Lys Asn
    645

```

<210> 29

<211> 645

<212> PRT

<213> Artificial Sequence

<220>

<223> Hybrid sequence

<400> 29

```

Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1           5           10           15
Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu Leu
          20           25           30
Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
          35           40           45
Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
          50           55           60
Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
65           70           75           80
Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
          85           90           95
Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
          100          105          110
Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
          115          120          125
Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Ile Asp Lys Asp His Ser
          130          135          140
Ala Pro Asn Trp Arg Pro Ile Asp Phe Glu Met Lys Asn Asp Lys Gly
145           150           155           160
Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Glu Pro Ala Arg Val
          165          170          175
Ile Phe Thr Lys Ser Lys Pro Ile Ile Glu Leu Gly Leu Gln Ser Gly
          180          185          190
Ser Thr Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
          195          200          205
Ile Lys Leu Val Ser Tyr Asp Thr Asp Lys Asp Tyr Ala Tyr Ile Arg
          210          215          220
Phe Ser Val Ser Asn Gly Thr Lys Glu Val Lys Ile Val Ser Ser Thr
225           230           235           240
His Phe Gly Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Val Phe
          245          250          255
Ala Gln Pro Ile Tyr Asn Asn Pro Asp Lys Phe Lys Thr Glu Glu Asp
          260          265          270
Tyr Asn Leu Gln Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
          275          280          285
Glu Arg Gln Val Tyr Glu Leu Glu Lys Ile Gln Asp Lys Leu Pro Glu
          290          295          300
Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Gln Thr Lys Lys Ala
305           310           315           320
Leu Ala Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
          325          330          335
Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Ala His Tyr Val Val
          340          345          350
Tyr Glu Ser Val Glu Asn Ser Glu Ser Met Met Asp Thr Phe Val Glu
          355          360          365
His Pro Ile Lys Thr Gly Thr Leu Asn Gly Lys Lys Tyr Met Val Met
          370          375          380
Lys Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Lys
385           390           395           400
Arg Val Arg Thr Ile Ser Lys Asp Pro Lys Asn Asn Thr Arg Thr Ile
          405          410          415

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```

Ile Phe Pro Tyr Val Glu Gly Lys Ala Leu Tyr Asp Ala Ile Val Lys
      420      425      430
Val Val Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
      435      440      445
Val Asp Lys Glu Ile Asn Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
      450      455      460
Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
465      470      475      480
Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
      485      490      495
Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
      500      505      510
Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
      515      520      525
Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
      530      535      540
Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
545      550      555      560
Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
      565      570      575
Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
      580      585      590
His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
      595      600      605
Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
610      615      620
Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
625      630      635      640
Arg Lys Arg Lys Asn
      645

```

<210> 30

<211> 645

<212> PRT

<213> Artificial Sequence

<220>

<223> Hybrid sequence

<400> 30

```

Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1      5      10      15
Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu Leu
      20      25      30
Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
      35      40      45
Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
      50      55      60
Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
65      70      75      80
Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
      85      90      95
Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
      100      105      110

```

Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
 115 120 125
 Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His Ser
 130 135 140
 Ala Pro Asn Ser Arg Pro Ile Asp Phe Glu Met Lys Lys Lys Asp Gly
 145 150 155 160
 Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Lys Pro Ala Arg Val
 165 170 175
 Ile Phe Thr Asp Ser Lys Pro Glu Ile Glu Leu Gly Leu Gln Ser Gly
 180 185 190
 Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
 195 200 205
 Ile Lys Leu Val Ser Tyr Asp Thr Val Lys Asp Tyr Ala Tyr Ile Arg
 210 215 220
 Phe Ser Val Ser Asn Gly Thr Lys Ala Val Lys Ile Val Ser Ser Thr
 225 230 235 240
 His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Glu Phe
 245 250 255
 Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
 260 265 270
 Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275 280 285
 Glu Arg Gln Val Tyr Glu Leu Asn Lys Ile Gln Asp Lys Leu Pro Glu
 290 295 300
 Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Asp Thr Lys Lys Ala
 305 310 315 320
 Leu Asp Glu Gln Val Lys Ser Ala Val Thr Glu Phe Gln Asn Val Gln
 325 330 335
 Pro Thr Asn Asp Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val
 340 345 350
 Tyr Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys
 355 360 365
 His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met
 370 375 380
 Glu Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln
 385 390 395 400
 Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
 405 410 415
 Ile Phe Pro Tyr Val Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys
 420 425 430
 Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460
 Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495
 Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
 500 505 510
 Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
 515 520 525
 Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
 530 535 540

Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
 545 550 555 560
 Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
 565 570 575
 Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
 580 585 590
 His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
 595 600 605
 Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
 610 615 620
 Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
 625 630 635 640
 Arg Lys Arg Lys Asn
 645

<210> 31
 <211> 645
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Hybrid sequence

<400> 31
 Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1 5 10 15
 Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu Leu
 20 25 30
 Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
 35 40 45
 Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50 55 60
 Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65 70 75 80
 Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
 85 90 95
 Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
 100 105 110
 Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
 115 120 125
 Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His Ser
 130 135 140
 Ala Pro Asn Ser Arg Pro Ile Asp Phe Glu Met Lys Lys Lys Asp Gly
 145 150 155 160
 Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Lys Pro Ala Arg Val
 165 170 175
 Ile Phe Thr Asp Ser Lys Pro Glu Ile Glu Leu Gly Leu Gln Ser Gly
 180 185 190
 Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
 195 200 205
 Ile Lys Leu Val Ser Tyr Asp Thr Val Lys Asp Tyr Ala Tyr Ile Arg
 210 215 220
 Phe Ser Val Ser Asn Gly Thr Lys Ala Val Lys Ile Val Ser Ser Thr
 225 230 235 240

His	Phe	Asn	Asn	Lys	Glu	Glu	Lys	Tyr	Asp	Tyr	Thr	Leu	Met	Glu	Phe
				245					250					255	
Ala	Gln	Pro	Ile	Tyr	Asn	Ser	Ala	Asp	Lys	Phe	Lys	Thr	Glu	Glu	Asp
			260					265					270		
Tyr	Lys	Ala	Glu	Lys	Leu	Leu	Ala	Pro	Tyr	Lys	Lys	Ala	Lys	Thr	Leu
		275					280					285			
Glu	Arg	Gln	Val	Tyr	Glu	Leu	Asn	Lys	Ile	Gln	Asp	Lys	Leu	Pro	Glu
	290					295				300					
Lys	Leu	Lys	Ala	Glu	Tyr	Lys	Lys	Lys	Leu	Glu	Asp	Thr	Lys	Lys	Ala
305					310					315					320
Leu	Asp	Glu	Gln	Val	Lys	Ser	Ala	Val	Thr	Glu	Phe	Gln	Asn	Val	Gln
			325						330					335	
Pro	Thr	Asn	Asp	Lys	Met	Thr	Asp	Leu	Gln	Asp	Thr	Lys	Tyr	Val	Val
			340					345					350		
Tyr	Glu	Ser	Val	Glu	Asn	Asn	Glu	Ser	Met	Met	Asp	Thr	Phe	Val	Lys
		355					360					365			
His	Pro	Ile	Lys	Thr	Gly	Met	Leu	Asn	Gly	Lys	Lys	Tyr	Met	Val	Met
	370					375						380			
Glu	Thr	Thr	Asn	Asp	Asp	Tyr	Trp	Lys	Asp	Phe	Met	Val	Glu	Gly	Gln
385					390					395					400
Arg	Val	Arg	Thr	Ile	Ser	Lys	Asp	Ala	Lys	Asn	Asn	Thr	Arg	Thr	Ile
			405						410					415	
Ile	Phe	Pro	Tyr	Ile	Glu	Gly	Lys	Thr	Leu	Tyr	Asp	Ala	Ile	Val	Lys
			420					425					430		
Val	His	Val	Lys	Thr	Ile	Asp	Tyr	Asp	Gly	Gln	Tyr	His	Val	Arg	Ile
		435					440					445			
Val	Asp	Lys	Glu	Ala	Phe	Thr	Lys	Ala	Asn	Thr	Asp	Lys	Ser	Asn	Lys
	450					455					460				
Lys	Glu	Gln	Gln	Asp	Asn	Ser	Ala	Lys	Lys	Glu	Ala	Thr	Pro	Ala	Thr
465					470					475					480
Pro	Ser	Lys	Pro	Thr	Pro	Ser	Pro	Val	Glu	Lys	Glu	Ser	Gln	Lys	Gln
			485						490					495	
Asp	Ser	Gln	Lys	Asp	Asp	Asn	Lys	Gln	Leu	Pro	Ser	Val	Glu	Lys	Glu
			500					505					510		
Asn	Asp	Ala	Ser	Ser	Glu	Ser	Gly	Lys	Asp	Lys	Thr	Pro	Ala	Thr	Lys
		515					520						525		
Pro	Thr	Lys	Gly	Glu	Val	Glu	Ser	Ser	Ser	Thr	Thr	Pro	Thr	Lys	Val
	530					535						540			
Val	Ser	Thr	Thr	Gln	Asn	Val	Ala	Lys	Pro	Thr	Thr	Ala	Ser	Ser	Lys
545					550					555					560
Thr	Thr	Lys	Asp	Val	Val	Gln	Thr	Ser	Ala	Gly	Ser	Ser	Glu	Ala	Lys
			565						570						575
Asp	Ser	Ala	Pro	Leu	Gln	Lys	Ala	Asn	Ile	Lys	Asn	Thr	Asn	Asp	Gly
			580					585					590		
His	Thr	Gln	Ser	Gln											

<210> 32

<211> 645

<212> PRT

<213> Artificial Sequence

<220>

<223> Hybrid sequence

<400> 32

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Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1           5           10           15
Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu Leu
 20           25           30
Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
 35           40           45
Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50           55           60
Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65           70           75           80
Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
 85           90           95
Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
100           105           110
Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
115           120           125
Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Glu His Ser
130           135           140
Ala Pro Asn Ser Arg Pro Ile Asp Phe Glu Met Lys Lys Lys Asp Gly
145           150           155           160
Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Lys Pro Ala Arg Val
165           170           175
Ile Phe Thr Asp Ser Lys Pro Glu Ile Glu Leu Gly Leu Gln Ser Gly
180           185           190
Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
195           200           205
Val Lys Leu Val Ser Tyr Asp Thr Val Lys Asp Tyr Ala Tyr Ile Arg
210           215           220
Phe Ser Val Ser Asn Gly Thr Lys Ala Val Lys Ile Val Ser Ser Thr
225           230           235           240
His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Glu Phe
245           250           255
Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
260           265           270
Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
275           280           285
Glu Arg Gln Val Tyr Glu Leu Asn Lys Ile Gln Asp Lys Leu Pro Glu
290           295           300
Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Asp Thr Lys Lys Ala
305           310           315           320
Leu Asp Glu Gln Val Lys Ser Ala Val Thr Glu Phe Gln Asn Val Gln
325           330           335
Pro Thr Asn Asp Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val
340           345           350
Tyr Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys
355           360           365
His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met
370           375           380

```

Glu Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln
 385 390 395 400
 Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
 405 410 415
 Ile Phe Pro Tyr Ile Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys
 420 425 430
 Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460
 Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495
 Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
 500 505 510
 Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
 515 520 525
 Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
 530 535 540
 Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
 545 550 555 560
 Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
 565 570 575
 Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
 580 585 590
 His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
 595 600 605
 Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
 610 615 620
 Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
 625 630 635 640
 Arg Lys Arg Lys Asn
 645

<210> 33
 <211> 645
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Hybrid sequence

<400> 33
 Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1 5 10 15
 Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu
 20 25 30
 Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
 35 40 45
 Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50 55 60
 Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65 70 75 80

Val	Ser	Asn	Lys	Glu	Val	Glu	Ala	Pro	Thr	Ser	Glu	Thr	Lys	Glu	Ala	
				85					90					95		
Lys	Glu	Val	Lys	Glu	Val	Lys	Ala	Pro	Lys	Glu	Thr	Lys	Glu	Val	Lys	
			100					105					110			
Pro	Ala	Ala	Lys	Ala	Thr	Asn	Asn	Thr	Tyr	Pro	Ile	Leu	Asn	Gln	Glu	
		115					120					125				
Leu	Arg	Glu	Ala	Ile	Lys	Asn	Pro	Ala	Ile	Lys	Asp	Lys	Glu	His	Ser	
	130					135					140					
Ala	Pro	Asn	Ser	Arg	Pro	Ile	Asp	Phe	Glu	Met	Lys	Lys	Lys	Asp	Gly	
145					150					155					160	
Thr	Gln	Gln	Phe	Tyr	His	Tyr	Ala	Ser	Ser	Val	Lys	Pro	Ala	Arg	Val	
				165					170						175	
Ile	Phe	Thr	Asp	Ser	Lys	Pro	Glu	Ile	Glu	Leu	Gly	Leu	Gln	Ser	Gly	
			180					185					190			
Gln	Phe	Trp	Arg	Lys	Phe	Glu	Val	Tyr	Glu	Gly	Asp	Lys	Lys	Leu	Pro	
		195					200					205				
Val	Lys	Leu	Val	Ser	Tyr	Asp	Thr	Val	Lys	Asp	Tyr	Ala	Tyr	Ile	Arg	
	210					215					220					
Phe	Ser	Val	Ser	Asn	Gly	Thr	Lys	Ala	Val	Lys	Ile	Val	Ser	Ser	Thr	
225					230					235					240	
His	Phe	Asn	Asn	Lys	Glu	Glu	Lys	Tyr	Asp	Tyr	Thr	Leu	Met	Glu	Phe	
				245					250					255		
Ala	Gln	Pro	Ile	Tyr	Asn	Ser	Ala	Asp	Lys	Phe	Lys	Thr	Glu	Glu	Asp	
			260					265					270			
Tyr	Lys	Ala	Glu	Lys	Leu	Leu	Ala	Pro	Tyr	Lys	Lys	Ala	Lys	Thr	Leu	
		275					280					285				
Glu	Arg	Gln	Val	Tyr	Glu	Leu	Asn	Lys	Ile	Gln	Asp	Lys	Leu	Pro	Glu	
	290					295					300					
Lys	Leu	Lys	Ala	Glu	Tyr	Lys	Lys	Lys	Leu	Glu	Asp	Thr	Lys	Lys	Ala	
305					310					315					320	
Leu	Asp	Glu	Gln	Val	Lys	Ser	Ala	Val	Thr	Glu	Phe	Gln	Asn	Val	Gln	
				325					330					335		
Pro	Thr	Asn	Asp	Lys	Met	Thr	Asp	Leu	Gln	Asp	Thr	Lys	Tyr	Val	Val	
			340					345					350			
Tyr	Glu	Ser	Val	Glu	Asn	Asn	Glu	Ser	Met	Met	Asp	Thr	Phe	Val	Lys	
		355					360					365				
His	Pro	Ile	Lys	Thr	Gly	Met	Leu	Asn	Gly	Lys	Lys	Tyr	Met	Val	Met	
	370					375					380					
Glu	Thr	Thr	Asn	Asp	Asp	Tyr	Trp	Lys	Asp	Phe	Met	Val	Glu	Gly	Gln	
385					390					395					400	
Arg	Val	Arg	Thr	Ile	Ser	Lys	Asp	Ala	Lys	Asn	Asn	Thr	Arg	Thr	Leu	
				405					410					415		
Ile	Phe	Pro	Tyr	Ile	Glu	Gly	Lys	Thr	Leu	Tyr	Asp	Ala	Ile	Val	Lys	
			420					425					430			
Val	His	Val	Lys	Thr	Ile	Asp	Tyr	Asp	Gly	Gln	Tyr	His	Val	Arg	Ile	
		435					440					445				
Val	Asp	Lys	Glu	Ala	Phe	Thr	Lys	Ala	Asn	Thr	Asp	Lys	Ser	Asn	Lys	
	450					455					460					
Lys	Glu	Gln	Gln	Asp	Asn	Ser	Ala	Lys	Lys	Glu	Ala	Thr	Pro	Ala	Thr	
465					470					475					480	
Pro	Ser	Lys	Pro	Thr	Pro	Ser	Pro	Val	Glu	Lys	Glu	Ser	Gln	Lys	Gln	
				485					490					495		
Asp	Ser	Gln	Lys	Asp	Asp	Asn	Lys	Gln	Leu	Pro	Ser	Val	Glu	Lys	Glu	
			500					505					510			


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Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
    515                520                525
Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
    530                535                540
Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
    545                550                555                560
Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
    565                570                575
Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
    580                585                590
His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
    595                600                605
Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
    610                615                620
Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
    625                630                635                640
Arg Lys Arg Lys Asn
    645

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<210> 34
 <211> 645
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Hybrid sequence

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<400> 34
Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1                5                10                15
Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu
    20                25                30
Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
    35                40                45
Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
    50                55                60
Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
    65                70                75                80
Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
    85                90                95
Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
    100               105               110
Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
    115               120               125
Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Glu His Ser
    130               135               140
Ala Pro Asn Ser Arg Pro Ile Asp Phe Glu Met Lys Lys Lys Asp Gly
    145               150               155               160
Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Lys Pro Ala Arg Val
    165               170               175
Ile Phe Thr Asp Ser Lys Pro Glu Ile Glu Leu Gly Leu Gln Ser Gly
    180               185               190
Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
    195               200               205

```

Val Lys Leu Val Ser Tyr Asp Thr Val Lys Asp Tyr Ala Tyr Ile Arg
 210 215 220
 Phe Ser Val Ser Asn Gly Thr Lys Ala Val Lys Ile Val Ser Ser Thr
 225 230 235 240
 His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Glu Phe
 245 250 255
 Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
 260 265 270
 Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275 280 285
 Glu Arg Gln Val Tyr Glu Leu Asn Lys Leu Gln Glu Lys Leu Pro Glu
 290 295 300
 Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Asp Thr Lys Lys Ala
 305 310 315 320
 Leu Asp Glu Gln Val Lys Ser Ala Val Thr Glu Phe Gln Asn Val Gln
 325 330 335
 Pro Thr Asn Asp Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val
 340 345 350
 Tyr Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys
 355 360 365
 His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met
 370 375 380
 Glu Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln
 385 390 395 400
 Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Leu
 405 410 415
 Ile Phe Pro Tyr Ile Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys
 420 425 430
 Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460
 Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495
 Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
 500 505 510
 Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
 515 520 525
 Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
 530 535 540
 Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
 545 550 555 560
 Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
 565 570 575
 Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
 580 585 590
 His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
 595 600 605
 Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
 610 615 620
 Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
 625 630 635 640

Arg Lys Arg Lys Asn
645

<210> 35

<211> 645

<212> PRT

<213> Artificial Sequence

<220>

<223> Hybrid sequence

<400> 35

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Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1           5           10           15
Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu Leu
 20           25           30
Met Ser Asn Gly Glu Ala Gln Ala Ala Ala Glu Glu Thr Gly Gly Thr
 35           40           45
Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50           55           60
Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65           70           75           80
Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
 85           90           95
Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
 100          105          110
Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
 115          120          125
Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His Ser
 130          135          140
Ala Pro Asn Ser Arg Pro Ile Asp Phe Glu Met Lys Lys Lys Asp Gly
 145          150          155          160
Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Lys Pro Ala Arg Val
 165          170          175
Ile Phe Thr Asp Ser Lys Pro Glu Ile Glu Leu Gly Leu Gln Ser Gly
 180          185          190
Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
 195          200          205
Val Lys Leu Val Ser Tyr Asp Thr Val Lys Asp Tyr Ala Tyr Ile Arg
 210          215          220
Phe Ser Val Ser Asn Gly Thr Lys Ala Val Lys Ile Val Ser Ser Thr
 225          230          235          240
His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Glu Phe
 245          250          255
Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
 260          265          270
Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275          280          285
Glu Arg Gln Val Tyr Glu Leu Asn Lys Ile Gln Asp Lys Leu Pro Glu
 290          295          300
Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Asp Thr Lys Lys Ala
 305          310          315          320
Leu Asp Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
 325          330          335

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Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val
      340      345      350
Tyr Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys
      355      360      365
His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met
      370      375      380
Glu Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln
385      390      395      400
Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
      405      410      415
Ile Phe Pro Tyr Val Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys
      420      425      430
Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
      435      440      445
Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
      450      455      460
Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
465      470      475      480
Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
      485      490      495
Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
      500      505      510
Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
      515      520      525
Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
      530      535      540
Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
545      550      555      560
Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
      565      570      575
Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
      580      585      590
His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
      595      600      605
Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
      610      615      620
Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
625      630      635      640
Arg Lys Arg Lys Asn
      645

```

<210> 36

<211> 645

<212> PRT

<213> Artificial Sequence

<220>

<223> Hybrid sequence

<400> 36

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Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1          5          10          15
Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu
      20          25          30

```

Met Ser Asn Gly Glu Ala Gln Ala Ala Ala Glu Glu Thr Gly Gly Thr
 35 40 45
 Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50 55 60
 Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65 70 75 80
 Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
 85 90 95
 Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
 100 105 110
 Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
 115 120 125
 Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His Ser
 130 135 140
 Ala Pro Asn Ser Arg Pro Ile Asp Phe Glu Met Lys Lys Lys Asp Gly
 145 150 155 160
 Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Lys Pro Ala Arg Val
 165 170 175
 Ile Phe Thr Asp Ser Lys Pro Glu Ile Glu Leu Gly Leu Gln Ser Gly
 180 185 190
 Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
 195 200 205
 Val Lys Leu Val Ser Tyr Asp Ser Val Lys Asp Tyr Ala Tyr Ile Arg
 210 215 220
 Phe Ser Val Ser Asn Gly Thr Arg Ala Val Lys Ile Val Ser Ser Thr
 225 230 235 240
 His Tyr Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Glu Phe
 245 250 255
 Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
 260 265 270
 Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275 280 285
 Glu Arg Gln Val Tyr Glu Leu Asn Lys Ile Gln Asp Lys Leu Pro Glu
 290 295 300
 Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Asp Thr Lys Lys Ala
 305 310 315 320
 Leu Asp Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
 325 330 335
 Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val
 340 345 350
 Tyr Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys
 355 360 365
 His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met
 370 375 380
 Glu Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln
 385 390 395 400
 Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
 405 410 415
 Ile Phe Pro Tyr Val Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys
 420 425 430
 Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460

Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495
 Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
 500 505 510
 Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
 515 520 525
 Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
 530 535 540
 Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
 545 550 555 560
 Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
 565 570 575
 Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
 580 585 590
 His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
 595 600 605
 Ser Leu Pro Gln Thr Gly Glu Ser Asn Lys Asp Met Thr Leu Pro
 610 615 620
 Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
 625 630 635 640
 Arg Lys Arg Lys Asn
 645

<210> 37

<211> 645

<212> PRT

<213> Artificial Sequence

<220>

<223> Hybrid sequence

<400> 37

Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1 5 10 15
 Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu
 20 25 30
 Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
 35 40 45
 Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50 55 60
 Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65 70 75 80
 Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
 85 90 95
 Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
 100 105 110
 Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
 115 120 125
 Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His Ser
 130 135 140
 Ala Pro Asn Ser Arg Pro Ile Asp Phe Glu Met Lys Lys Lys Asp Gly
 145 150 155 160

Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Lys Pro Ala Arg Val
 165 170 175
 Ile Phe Thr Asp Thr Lys Pro Glu Ile Glu Leu Gly Leu Gln Ser Gly
 180 185 190
 Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
 195 200 205
 Val Lys Leu Val Ser Tyr Asp Ser Val Lys Asp Tyr Ala Tyr Ile Arg
 210 215 220
 Phe Ser Val Ser Asn Gly Thr Arg Ala Val Lys Ile Val Ser Ser Thr
 225 230 235 240
 His Tyr Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Glu Phe
 245 250 255
 Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
 260 265 270
 Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275 280 285
 Glu Arg Gln Val Tyr Glu Leu Asn Lys Ile Gln Asp Lys Leu Pro Glu
 290 295 300
 Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Asp Thr Lys Lys Ala
 305 310 315 320
 Leu Asp Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
 325 330 335
 Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val
 340 345 350
 Tyr Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys
 355 360 365
 His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met
 370 375 380
 Glu Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln
 385 390 395 400
 Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
 405 410 415
 Ile Phe Pro Tyr Val Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys
 420 425 430
 Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460
 Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495
 Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
 500 505 510
 Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
 515 520 525
 Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
 530 535 540
 Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
 545 550 555 560
 Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
 565 570 575
 Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
 580 585 590

His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
 595 600 605
 Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
 610 615 620
 Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
 625 630 635 640
 Arg Lys Arg Lys Asn
 645

<210> 38
 <211> 645
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Hybrid sequence

<400> 38
 Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1 5 10 15
 Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu Leu
 20 25 30
 Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
 35 40 45
 Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50 55 60
 Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65 70 75 80
 Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
 85 90 95
 Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
 100 105 110
 Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
 115 120 125
 Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His Ser
 130 135 140
 Ala Pro Asn Ser Arg Pro Ile Asp Phe Glu Met Lys Lys Lys Asp Gly
 145 150 155 160
 Thr Gln Gln Phe Tyr His Tyr Ala Ser Thr Val Lys Pro Ala Arg Val
 165 170 175
 Ile Phe Thr Asp Thr Lys Pro Glu Ile Glu Leu Gly Leu Gln Ser Gly
 180 185 190
 Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
 195 200 205
 Val Lys Leu Val Ser Tyr Asp Ser Val Lys Asp Tyr Ala Tyr Ile Arg
 210 215 220
 Phe Ser Val Ser Asn Gly Thr Arg Ala Val Lys Ile Val Ser Ser Thr
 225 230 235 240
 His Tyr Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Glu Phe
 245 250 255
 Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
 260 265 270
 Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275 280 285

Glu Arg Gln Val Tyr Glu Leu Asn Lys Ile Gln Asp Lys Leu Pro Glu
 290 295 300
 Lys Leu Lys Ala Glu Tyr Lys Lys Leu Glu Asp Thr Lys Lys Ala
 305 310 315 320
 Leu Asp Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
 325 330 335
 Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val
 340 345 350
 Tyr Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys
 355 360 365
 His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met
 370 375 380
 Glu Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln
 385 390 395 400
 Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
 405 410 415
 Ile Phe Pro Tyr Val Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys
 420 425 430
 Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460
 Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495
 Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
 500 505 510
 Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
 515 520 525
 Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
 530 535 540
 Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
 545 550 555 560
 Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
 565 570 575
 Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
 580 585 590
 His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
 595 600 605
 Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
 610 615 620
 Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
 625 630 635 640
 Arg Lys Arg Lys Asn
 645

<210> 39
 <211> 645
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Hybrid sequence

<400> 39

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Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
1      5      10      15
Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu
20      25      30
Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
35      40      45
Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
50      55      60
Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
65      70      75      80
Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
85      90      95
Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
100     105     110
Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
115     120     125
Leu Arg Asp Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Glu His Thr
130     135     140
Ala Pro Asn Ser Arg Pro Ile Asp Phe Glu Met Lys Lys Lys Asp Gly
145     150     155     160
Thr Gln Gln Phe Tyr His Tyr Ala Ser Thr Val Lys Pro Ala Arg Val
165     170     175
Ile Phe Thr Asp Thr Lys Pro Glu Ile Glu Leu Gly Leu Gln Ser Gly
180     185     190
Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
195     200     205
Val Lys Leu Val Ser Tyr Asp Ser Val Lys Asp Tyr Ala Tyr Ile Arg
210     215     220
Phe Ser Val Ser Asn Gly Thr Arg Ala Val Lys Ile Val Ser Ser Thr
225     230     235     240
His Tyr Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Glu Phe
245     250     255
Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
260     265     270
Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
275     280     285
Glu Arg Gln Val Tyr Glu Leu Asn Lys Ile Gln Asp Lys Leu Pro Glu
290     295     300
Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Asp Thr Lys Lys Ala
305     310     315     320
Leu Asp Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
325     330     335
Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val
340     345     350
Tyr Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys
355     360     365
His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met
370     375     380
Glu Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln
385     390     395     400
Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
405     410     415
Ile Phe Pro Tyr Val Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys
420     425     430

```

Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460
 Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495
 Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
 500 505 510
 Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
 515 520 525
 Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
 530 535 540
 Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
 545 550 555 560
 Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
 565 570 575
 Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
 580 585 590
 His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
 595 600 605
 Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
 610 615 620
 Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
 625 630 635 640
 Arg Lys Arg Lys Asn
 645

<210> 40

<211> 645

<212> PRT

<213> Artificial Sequence

<220>

<223> Hybrid sequence

<400> 40

Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1 5 10 15
 Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu Leu
 20 25 30
 Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
 35 40 45
 Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50 55 60
 Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65 70 75 80
 Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
 85 90 95
 Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
 100 105 110
 Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
 115 120 125

Leu Arg Asp Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Glu His Thr
 130 135 140
 Ala Pro Asn Ser Arg Pro Ile Asp Phe Glu Met Lys Lys Lys Asp Gly
 145 150 155 160
 Thr Gln Gln Phe Tyr His Tyr Ala Ser Thr Val Lys Pro Ala Arg Val
 165 170 175
 Ile Phe Thr Asp Thr Lys Pro Glu Ile Glu Leu Gly Leu Gln Thr Ala
 180 185 190
 Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
 195 200 205
 Val Lys Leu Val Ser Tyr Asp Ser Val Lys Asp Tyr Ala Tyr Ile Arg
 210 215 220
 Phe Ser Val Ser Asn Gly Thr Arg Ala Val Lys Ile Val Ser Ser Thr
 225 230 235 240
 His Tyr Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Glu Phe
 245 250 255
 Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Tyr Lys Thr Glu Glu Asp
 260 265 270
 Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275 280 285
 Glu Arg Gln Val Tyr Glu Leu Asn Lys Leu Gln Asp Lys Leu Pro Glu
 290 295 300
 Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Asp Asp Thr Lys Lys Ala
 305 310 315 320
 Leu Asp Asp Gln Val Lys Ser Ala Val Thr Glu Phe Gln Asn Val Gln
 325 330 335
 Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val
 340 345 350
 Tyr Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys
 355 360 365
 His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met
 370 375 380
 Glu Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln
 385 390 395 400
 Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
 405 410 415
 Ile Phe Pro Tyr Val Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys
 420 425 430
 Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460
 Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495
 Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
 500 505 510
 Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
 515 520 525
 Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
 530 535 540
 Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
 545 550 555 560

[illegible]

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<210> 41
<211> 639
<212> PRT
<213> Artificial Sequence
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<220>
<223> Hybrid sequence

<400> 41															
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Ser	Ser	Leu	Gly 20	Val	Ala	Ser	Val	Ala 25	Ile	Ser	Thr	Leu 30	Leu	Leu	Leu
Met	Ser	Asn 35	Gly	Glu	Ala	Gln 40	Ala	Ala	Ala	Glu	Glu 45	Thr	Gly	Gly	Thr
Asn 50	Thr	Glu	Ala	Gln	Pro	Lys 55	Thr	Glu	Ala	Val	Ala 60	Ser	Pro	Thr	Thr
Thr 65	Ser	Glu	Lys	Ala	Pro 70	Glu	Thr	Lys	Pro	Val	Ala 75	Asn	Ala	Val	Ser 80
Val	Ser	Asn	Lys 85	Glu	Val	Glu	Ala	Pro 90	Thr	Ser	Glu	Thr	Lys	Glu	Ala 95
Lys	Glu	Val	Lys 100	Glu	Val	Lys	Ala	Pro 105	Lys	Glu	Thr	Lys	Glu	Val	Lys 110
Pro	Ala	Ala 115	Lys	Ala	Thr	Asn	Asn 120	Thr	Tyr	Pro	Ile	Leu	Asn	Gln	Glu
Leu 130	Arg	Glu	Ala	Ile	Lys	Asn 135	Pro	Ala	Ile	Ile	Asp 140	Lys	Asp	His	Ser
Ala 145	Pro	Asn	Ser	Arg	Pro 150	Ile	Asp	Phe	Glu	Met	Lys 155	Lys	Lys	Asp	Gly 160
Thr	Gln	Gln	Phe 165	Tyr	His	Tyr	Ala	Ser	Ser 170	Val	Lys	Pro	Ala	Arg	Val 175
Ile	Phe	Thr	Lys 180	Thr	Gly	Pro	Val	Ile	Glu 185	Leu	Gly	Leu	Lys	Thr	Ala 190
Ser	Thr	Trp	Arg	Lys	Phe	Glu	Val	Tyr	Glu	Gly	Asp 205	Lys	Lys	Leu	Pro 210
Ile	Lys	Leu	Val	Ser	Tyr	Asp 215	Thr	Val	Lys	Asp	Tyr 220	Ala	Tyr	Ile	Arg
Phe 225	Pro	Val	Ser	Asn	Gly 230	Thr	Arg	Asp	Val	Lys	Ile 235	Val	Ser	Ser	Ile 240
Glu	Tyr	Gly	Glu	Asn 245	Ile	His	Glu	Asp	Tyr 250	Asp	Tyr	Thr	Leu	Met	Val 255

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Phe Ala Gln Pro Ile Thr Asn Asn Pro Asp Asp Tyr Val Asp Glu Glu
      260      265      270
Thr Tyr Asn Leu Gln Lys Leu Leu Ala Pro Tyr His Lys Ala Lys Thr
      275      280      285
Leu Glu Arg Gln Val Tyr Glu Leu Asn Lys Ile Gln Asp Lys Leu Pro
      290      295      300
Glu Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Asp Thr Lys Lys
      305      310      315      320
Ala Leu Asp Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val
      325      330      335
Gln Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val
      340      345      350
Val Phe Glu Ser Glu Glu Asn Ser Glu Ser Val Met Asp Gly Phe Val
      355      360      365
Glu His Pro Phe Tyr Thr Ala Thr Leu Asn Gly Gln Lys Tyr Val Val
      370      375      380
Met Lys Thr Lys Asp Asp Ser Tyr Trp Lys Asp Leu Ile Val Glu Gly
      385      390      395      400
Lys Arg Val Thr Thr Val Ser Lys Asp Pro Lys Asn Asn Ser Arg Thr
      405      410      415
Ile Ile Phe Pro Tyr Val Glu Gly Lys Ala Val Tyr Asn Ala Ile Val
      420      425      430
Lys Val Val Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg
      435      440      445
Ile Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn
      450      455      460
Lys Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala
      465      470      475      480
Thr Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys
      485      490      495
Gln Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys
      500      505      510
Glu Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr
      515      520      525
Lys Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys
      530      535      540
Val Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser
      545      550      555      560
Lys Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala
      565      570      575
Lys Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp
      580      585      590
Gly His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala
      595      600      605
Lys Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu
      610      615      620
Pro Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val
      625      630      635

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<210> 42

<211> 890

<212> PRT

<213> Artificial Sequence

<220>

<223> Hybrid sequence

<400> 42

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Met Asn Lys His His Pro Lys Leu Arg Ser Phe Tyr Ser Ile Arg Lys
 1           5           10           15
Ser Thr Leu Gly Val Ala Ser Val Ile Val Ser Thr Leu Phe Leu Ile
      20           25           30
Thr Ser Gln His Gln Ala Gln Ala Ala Glu Asn Thr Asn Thr Ser Asp
      35           40           45
Lys Ile Ser Glu Asn Gln Asn Asn Asn Ala Thr Thr Thr Gln Gln Pro
      50           55           60
Lys Asp Thr Asn Gln Thr Gln Pro Ala Thr Gln Pro Val Ile Thr Ala
      65           70           75           80
Lys Asn Tyr Pro Ala Ala Asp Glu Ser Leu Lys Asp Ala Ile Lys Asp
      85           90           95
Pro Ala Leu Glu Asn Lys Glu His Asp Ile Gly Pro Arg Glu Gln Val
      100           105           110
Asn Phe Gln Leu Leu Asp Lys Asn Asn Glu Thr Gln Tyr Tyr His Phe
      115           120           125
Phe Ser Ile Lys Asp Pro Ala Asp Val Tyr Tyr Thr Lys Lys Lys Ala
      130           135           140
Glu Val Glu Leu Asp Ile Asn Thr Ala Ser Thr Trp Lys Lys Phe Glu
      145           150           155           160
Val Tyr Glu Asn Asn Gln Lys Leu Pro Val Arg Leu Val Ser Tyr Ser
      165           170           175
Pro Val Pro Glu Asp His Ala Tyr Ile Arg Phe Pro Val Ser Asp Gly
      180           185           190
Thr Gln Glu Leu Lys Ile Val Ser Ser Thr Gln Ile Asp Asp Gly Glu
      195           200           205
Glu Thr Asn Tyr Asp Tyr Thr Lys Leu Val Phe Ala Lys Pro Ile Tyr
      210           215           220
Asn Asp Pro Ser Leu Val Lys Ser Asp Thr Asn Asp Ala Val Val Thr
      225           230           235           240
Asn Asp Gln Ser Ser Ser Asp Ala Ser Asn Gln Thr Asn Thr Asn Thr
      245           250           255
Ser Asn Gln Asn Thr Ser Thr Thr Asn Asn Ala Asn Asn Gln Pro Gln
      260           265           270
Ala Thr Thr Asn Met Ser Gln Pro Ala Gln Pro Lys Ser Ser Ala Asn
      275           280           285
Ala Asp Gln Ala Ser Ser Gln Pro Ala His Glu Thr Asn Ser Asn Gly
      290           295           300
Asn Thr Asn Asp Lys Thr Asn Glu Ser Ser Asn Gln Ser Asp Val Asn
      305           310           315           320
Gln Gln Tyr Pro Pro Ala Asp Glu Ser Leu Gln Asp Ala Ile Lys Asn
      325           330           335
Pro Ala Ile Lys Asp Lys Asp His Ser Ala Pro Asn Ser Arg Pro Ile
      340           345           350
Asp Phe Glu Met Lys Lys Lys Asp Gly Thr Gln Gln Phe Tyr His Tyr
      355           360           365
Ala Ser Ser Val Lys Pro Ala Arg Val Ile Phe Thr Asp Ser Lys Pro
      370           375           380
Glu Ile Glu Leu Gly Leu Gln Ser Gly Gln Phe Trp Arg Lys Phe Glu
      385           390           395           400
Val Tyr Glu Gly Asp Lys Lys Leu Pro Ile Lys Leu Val Ser Tyr Asp
      405           410           415

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Thr Val Lys Asp Tyr Ala Tyr Ile Arg Phe Ser Val Ser Asn Gly Thr
 420 425 430
 Lys Ala Val Lys Ile Val Ser Ser Thr His Phe Asn Asn Lys Glu Glu
 435 440 445
 Lys Tyr Asp Tyr Thr Leu Met Glu Phe Ala Gln Pro Ile Tyr Asn Ser
 450 455 460
 Ala Asp Lys Phe Lys Thr Glu Glu Asp Tyr Lys Ala Glu Lys Leu Leu
 465 470 475 480
 Ala Pro Tyr Lys Lys Ala Lys Thr Leu Glu Arg Gln Val Tyr Glu Leu
 485 490 495
 Asn Lys Ile Gln Asp Lys Leu Pro Glu Lys Leu Lys Ala Glu Tyr Lys
 500 505 510
 Lys Lys Leu Glu Asp Thr Lys Lys Ala Leu Asp Glu Gln Val Lys Ser
 515 520 525
 Ala Ile Thr Glu Phe Gln Asn Val Gln Pro Thr Asn Glu Lys Met Thr
 530 535 540
 Asp Leu Gln Asp Thr Lys Tyr Val Val Tyr Glu Ser Val Glu Asn Asn
 545 550 555 560
 Glu Ser Met Met Asp Thr Phe Val Lys His Pro Ile Lys Thr Gly Met
 565 570 575
 Leu Asn Gly Lys Lys Tyr Met Val Met Glu Thr Thr Asn Asp Tyr
 580 585 590
 Trp Lys Asp Phe Met Val Glu Gly Gln Arg Val Arg Thr Ile Ser Lys
 595 600 605
 Asp Ala Lys Asn Asn Thr Arg Thr Ile Ile Phe Pro Tyr Val Glu Gly
 610 615 620
 Lys Thr Leu Tyr Asp Ala Ile Val Lys Val His Val Lys Thr Ile Asp
 625 630 635 640
 Tyr Asp Gly Gln Tyr His Val Arg Ile Ile Asn Gln Asp Ile Asn Thr
 645 650 655
 Lys Asp Asp Asp Thr Ser Gln Asn Asn Thr Ser Glu Pro Leu Asn Val
 660 665 670
 Gln Thr Gly Gln Glu Gly Lys Val Ala Asp Thr Asp Val Ala Glu Asn
 675 680 685
 Ser Ser Thr Ala Thr Asn Pro Lys Asp Ala Ser Asp Lys Ala Asp Val
 690 695 700
 Ile Glu Pro Glu Ser Asp Val Val Lys Asp Ala Asp Asn Asn Ile Asp
 705 710 715 720
 Lys Asp Val Gln His Asp Val Asp His Leu Ser Asp Met Ser Asp Asn
 725 730 735
 Asn His Phe Asp Lys Tyr Asp Leu Lys Glu Met Asp Thr Gln Ile Ala
 740 745 750
 Lys Asp Thr Asp Arg Asn Val Asp Asn Ser Val Gly Met Ser Ser Asn
 755 760 765
 Val Asp Thr Asp Lys Asp Ser Asn Lys Asn Lys Asp Lys Val Ile Gln
 770 775 780
 Leu Ala His Ile Ala Asp Lys Asn Asn His Thr Gly Lys Ala Ala Lys
 785 790 795 800
 Leu Asp Val Val Lys Gln Asn Tyr Asn Asn Thr Asp Lys Val Thr Asp
 805 810 815
 Lys Lys Thr Thr Glu His Leu Pro Ser Asp Ile His Lys Thr Val Asp
 820 825 830
 Lys Thr Val Lys Thr Lys Glu Lys Ala Gly Thr Pro Ser Lys Glu Asn
 835 840 845

Lys Leu Ser Gln Ser Lys Met Leu Pro Lys Thr Gly Glu Thr Thr Ser
 850 855 860
 Ser Gln Ser Trp Trp Gly Leu Tyr Ala Leu Leu Gly Met Leu Ala Leu
 865 870 875 880
 Phe Ile Pro Lys Phe Arg Lys Glu Ser Lys
 885 890

<210> 43

<211> 639

<212> PRT

<213> Artificial Sequence

<220>

<223> Hybrid sequence

<400> 43

Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
 1 5 10 15
 Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu Leu
 20 25 30
 Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
 35 40 45
 Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50 55 60
 Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65 70 75 80
 Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
 85 90 95
 Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val Lys
 100 105 110
 Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
 115 120 125
 Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Ile Asp Lys Glu His Thr
 130 135 140
 Ala Asp Asn Trp Arg Pro Ile Asp Phe Gln Met Lys Asn Asp Lys Gly
 145 150 155 160
 Glu Arg Gln Phe Tyr His Tyr Ala Ser Thr Val Glu Pro Ala Thr Val
 165 170 175
 Ile Phe Thr Lys Thr Gly Pro Val Ile Glu Leu Gly Leu Lys Thr Ala
 180 185 190
 Ser Thr Trp Lys Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
 195 200 205
 Val Glu Leu Val Ser Tyr Asp Ser Asp Lys Asp Tyr Ala Tyr Ile Arg
 210 215 220
 Phe Pro Val Ser Asn Gly Thr Arg Asp Val Lys Ile Val Ser Ser Ile
 225 230 235 240
 Glu Tyr Gly Glu Asn Ile His Glu Asp Tyr Asp Tyr Thr Leu Met Val
 245 250 255
 Phe Ala Gln Pro Ile Thr Asn Asn Pro Asp Asp Tyr Val Asp Glu Glu
 260 265 270
 Thr Tyr Asn Leu Gln Lys Leu Leu Ala Pro Tyr His Lys Ala Lys Thr
 275 280 285
 Leu Glu Arg Gln Val Tyr Glu Leu Glu Lys Leu Gln Glu Lys Leu Pro
 290 295 300

Glu Lys Tyr Lys Ala Glu Tyr Lys Lys Lys Leu Asp Gln Thr Arg Val
 305 310 315 320
 Glu Leu Ala Asp Gln Val Lys Ser Ala Val Thr Glu Phe Glu Asn Val
 325 330 335
 Thr Pro Thr Asn Asp Gln Leu Thr Asp Leu Gln Glu Ala His Phe Val
 340 345 350
 Val Phe Glu Ser Glu Glu Asn Ser Glu Ser Val Met Asp Gly Phe Val
 355 360 365
 Glu His Pro Phe Tyr Thr Ala Thr Leu Asn Gly Gln Lys Tyr Val Val
 370 375 380
 Met Lys Thr Lys Asp Asp Ser Tyr Trp Lys Asp Leu Ile Val Glu Gly
 385 390 395 400
 Lys Arg Val Thr Thr Val Ser Lys Asp Pro Lys Asn Asn Ser Arg Thr
 405 410 415
 Leu Ile Phe Pro Tyr Ile Pro Asp Lys Ala Val Tyr Asn Ala Ile Val
 420 425 430
 Lys Val Val Val Ala Asn Ile Gly Tyr Glu Gly Gln Tyr His Val Arg
 435 440 445
 Ile Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn
 450 455 460
 Lys Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala
 465 470 475 480
 Thr Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys
 485 490 495
 Gln Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys
 500 505 510
 Glu Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr
 515 520 525
 Lys Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys
 530 535 540
 Val Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser
 545 550 555 560
 Lys Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala
 565 570 575
 Lys Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp
 580 585 590
 Gly His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala
 595 600 605
 Lys Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu
 610 615 620
 Pro Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val
 625 630 635

<210> 44

<211> 654

<212> PRT

<213> Artificial Sequence

<220>

<223> 0657 mutated protein

<400> 44

Met Gly Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg
 1 5 10 15

Lys Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu
 20 25 30
 Leu Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly
 35 40 45
 Thr Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr
 50 55 60
 Thr Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val
 65 70 75 80
 Ser Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu
 85 90 95
 Ala Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Glu Val
 100 105 110
 Lys Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln
 115 120 125
 Glu Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His
 130 135 140
 Ser Ala Pro Asn Ser Arg Pro Ile Asp Phe Glu Met Lys Lys Lys Asp
 145 150 155 160
 Gly Thr Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Lys Pro Ala Arg
 165 170 175
 Val Ile Phe Thr Asp Ser Lys Pro Glu Ile Glu Leu Gly Leu Gln Ser
 180 185 190
 Gly Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu
 195 200 205
 Pro Ile Lys Leu Val Ser Tyr Asp Thr Val Lys Asp Tyr Ala Tyr Ile
 210 215 220
 Arg Phe Ser Val Ser Asn Gly Thr Lys Ala Val Lys Ile Val Ser Ser
 225 230 235 240
 Thr His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Glu
 245 250 255
 Phe Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu
 260 265 270
 Asp Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr
 275 280 285
 Leu Glu Arg Gln Val Tyr Glu Leu Asn Lys Ile Gln Asp Lys Leu Pro
 290 295 300
 Glu Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Asp Thr Lys Lys
 305 310 315 320
 Ala Leu Asp Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val
 325 330 335
 Gln Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val
 340 345 350
 Val Tyr Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val
 355 360 365
 Lys His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val
 370 375 380
 Met Glu Thr Thr Asn Asp Tyr Trp Lys Asp Phe Met Val Glu Gly
 385 390 395 400
 Gln Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr
 405 410 415
 Ile Ile Phe Pro Tyr Val Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val
 420 425 430
 Lys Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg
 435 440 445

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Ile Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn
  450          455          460
Lys Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala
465          470          475          480
Thr Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys
          485          490          495
Gln Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys
          500          505          510
Glu Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr
          515          520          525
Lys Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys
          530          535          540
Val Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser
545          550          555          560
Lys Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala
          565          570          575
Lys Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp
          580          585          590
Gly His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala
          595          600          605
Lys Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu
          610          615          620
Pro Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu
625          630          635          640
Pro Arg Lys Arg Lys Asn Leu Glu His His His His His His
          645          650

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<210> 45

<211> 1938

<212> DNA

<213> Artificial Sequence

<220>

<223> 0657 cDNA

<400> 45

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gcagctgaag aaacaggtgg tacaaataca gaagcacaac caaaaactga agcagttgca 180
agtccaacaa caacatctga aaaagctcca gaaactaaac cagtagctaa tgctgtctca 240
gtatctaata aagaagttga ggcccctact tctgaaacaa aagaagctaa agaagttaaa 300
gaagttaaag cccctaagga aacaaaagaa gttaaaccag cagcaaaagc cactaacaat 360
acatatccta ttttgaatca ggaacttaga gaagcgatta aaaaccctgc aataaaagac 420
aaagatcata gcgcaccaa ctctcgtcca attgattttg aaatgaaaaa gaaagatgga 480
actcaaacgt tttatcatta tgcaagttct gttaaacctg ctagagttat tttcactgat 540
tcaaaaccag aaattgaatt aggattacaa tcaggtcaat tttggagaaa atttgaagtt 600
tatgaagggtg acaaaaagtt gccaatataa ttagttatcat acgatactgt taaagattat 660
gcttacattc gcttctctgt atcaaacgga acaaaagctg ttaaaattgt tagttcaaca 720
cacttcaata accaagaaga aaaatacgat tacacattaa tggaattcgc acaaccaatt 780
tataacagtg cagataaatt caaaactgaa gaagattata aagctgaaaa attattagcg 840
ccatataaaa aagcgaaaac actagaaaga caagtttatg aattaaataa aattcaagat 900
aaacttcctg aaaaattaaa ggctgagtag aagaagaaat tagaggatac aaagaaagct 960
ttagatgagc aagtgaatc agctattact gaattccaaa atgtacaacc aacaaatgaa 1020
aaaatgactg atttacaaga taaaaaatat gttgtttatg aaagtgttga gaataacgaa 1080
tctatgatgg atacttttgt taaacaccct attaaaacag gtatgcttaa cggcaaaaaa 1140

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tatatgggtca tggaaactac taatgacgat tactggaaag atttcatggt tgaaggtcaa 1200
cgtgttagaa ctataagcaa agatgctaaa aataatacta gaacaattat tttcccatat 1260
gttgaaggta aaactctata tgatgctatc gttaaagttc acgtaaaaac gattgattat 1320
gatggacaat accatgtcag aatcgttgat aaagaagcat ttacaaaagc caataccgat 1380
aaatctaaca aaaaagaaca acaagataac tcagctaaga aggaagctac tccagctacg 1440
cctagcaaac caacaccatc acctggttgaa aaagaatcac aaaaacaaga cagccaaaaa 1500
gatgacaata aacaattacc aagtgttgaa aaagaaaatg acgcatctag tgagtcagggt 1560
aaagacaaaa cgctgtctac aaaaccaact aaagggtgaag tagaatcaag tagtacaact 1620
ccaactaagg tagtatctac gactcaaaat gttgcaaaac caacaactgc ttcataaaaa 1680
acaacaaaag atgttgttca aacttcagca ggttctagcg aagcaaaaaga tagtgctcca 1740
ttacaaaagc caaacattaa aaacacaaat gatggacaca ctcaaagcca aaacaataaa 1800
aatacacaag aaaataaagc aaaatcatta ccacaaactg gtgaagaatc aaataaagat 1860
atgacattac cattaatggc attattagct ttaagtagca tcgttgcatt cgtattacct 1920
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1938

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<210> 46

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> ORF0657nF primer

<400> 46

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39

<210> 47

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> ORF0657nF encoded amino acid

<400> 47

Asn Arg Phe Ser Met Gly Asn Lys Gln Gln Lys Glu

1

5

10

<210> 48

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> ORF0657nR primer sequence

<400> 48

gtattacctta gaaaacgtaa aaacctcgag aaaccggt

38

<210> 49

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> ORF0657nR encoded amino acid

<400> 49

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1 5 10

<210> 50

<211> 16

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 50

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16

<210> 51

<211> 17

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 51

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17

<210> 52

<211> 1938

<212> DNA

<213> Artificial Sequence

<220>

<223> cDNA encoding ORF0657n protein of SEQ 3

<400> 52

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aaagatcata gcgcaccaaa ctctcgtcca attgattttg aaatgaaaaa gaaagatgga 480
actcaacagt tttatcatta tgcaagttct gttaaaccctg ctagagttat tttcactgat 540
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cacttcaata acaaaagaaga aaaatacgat tacacattaa tggaattcgc acaaccaatt 780
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ccatataaaa aagcgaaaac actagaaaga caagtttatg aattaaataa aattcaagat 900
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<210> 53

<211> 1938

<212> DNA

<213> Artificial Sequence

<220>

<223> cDNA encoding ORF0657n protein of SEQ 4

<400> 53

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gagcaacaat tttatcatta tgccagctct gttaaaccctg ctagagttat tttcactgat 540
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cacttcaata acaagaaga aaaatacgat tacacattaa tggaattcgc acaaccaatt 780
tataacagtg cagataaatt caaaactgaa gaagattata agctgaaaaa attattagcg 840
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aatacacaag aaaataaagc aaaatcatta ccacaaactg gtgaagaatc aaataaagat 1860
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 agaaaacgta aaaactaa 1938

<210> 54

<211> 1935

<212> DNA

<213> Artificial Sequence

<220>

<223> cDNA encoding ORF0657n protein of SEQ 5

<400> 54

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 ccaacaacaa catctgaaaa agctccagaa actaaaccag tagctaattgc tgtctcagta 240
 tctaataaag aagttgaggc ccctacttct gaaacaaaag aagctaaaga agttaaagaa 300
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 caacaatttt atcattatgc cagctctggt aaacctgcta gagttatatt cactgattca 540
 aaaccagaaa ttgaattagg attacaatca ggtcaatttt ggagaaaatt tgaagtttat 600
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 tacattcgtt tctctgtatc aaatggaaca aaagctgtta aaattgttag ttcaacacac 720
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 acacaagaaa ataaagcaaa atcattacca caaactggtg aagaatcaaa taaagatatg 1860
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<210> 55

<211> 1935

<212> DNA

<213> Artificial Sequence

<220>

<223> cDNA encoding ORF0657n protein of SEQ 6

<400> 55

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gttaaagccc ctaaggaaac aaaagcagtt aaaccagcaa caaaagccga taacaatata 360
tatacctatct tgaatcagga acttagagaa gcgattaaaa accctgcaat aaaagataaa 420
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caacaatctt atcattatgc cagctctgtt aaacctgcta gagttatttt cactgattca 540
aaaccagaaa ttgaattagg attacaatca ggtcaatttt ggagaaaatt tgaagtttat 600
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acacaagaaa ataaagcaaa atcattacca caaactggtg aagaatcaaa taaagatatg 1860
acattacat taatggcatt attagcttta agtagcatcg ttgcattcgt attacctaga 1920
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<210> 56

<211> 1934

<212> DNA

<213> Artificial Sequence

<220>

<223> cDNA encoding ORF0657n protein of SEQ 7

<400> 56

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tatacctatct tgaatgagga acttagagaa gcgattaaaa acccagcaat aaaagataaa 420
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aaaccagaaa ttgaattagg attacaatca ggtcaatttt ggagaaaatt tgaagtttat 600

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aacgtaaaaa ctaa
1934

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